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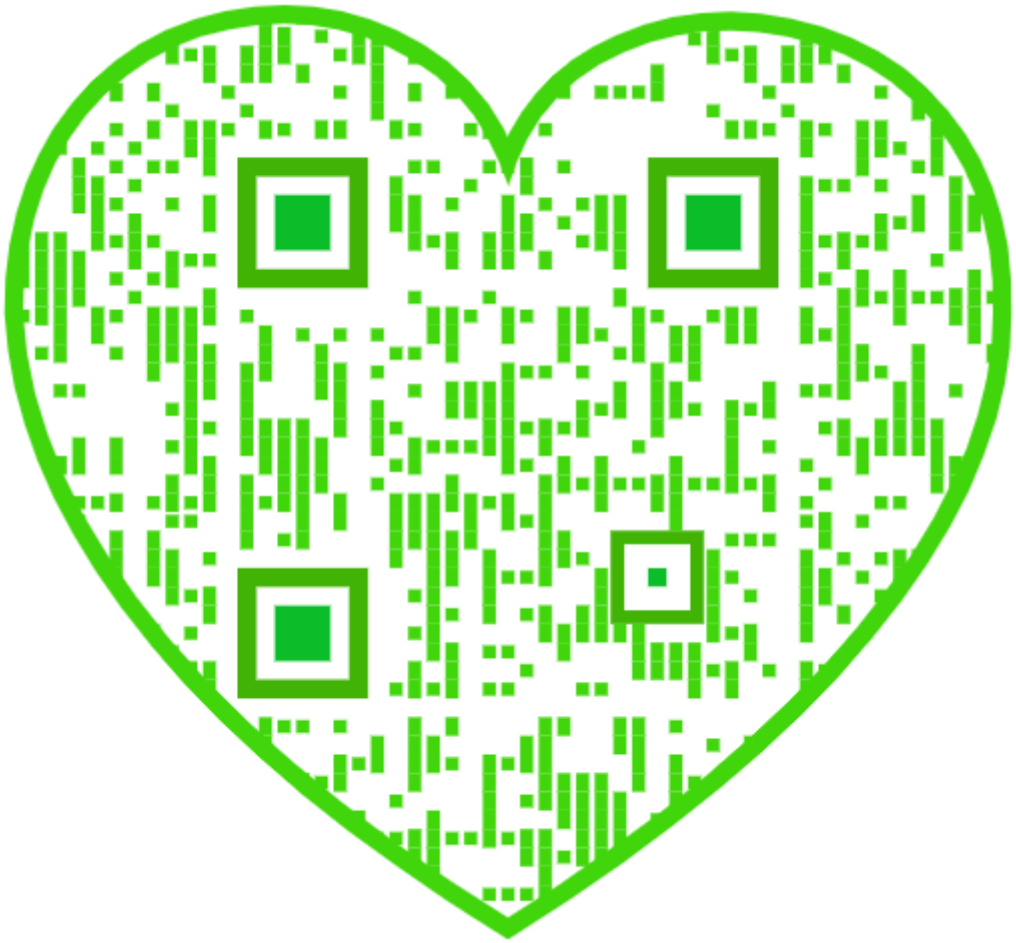

Scientific American.

A JOURNAL OF PRACTICAL INFORMATION IN ART, SCIENCE, MECHANICS, AGRICULTURE, CHEMISTRY, AND MANUFACTURES

VOL. 1.—No. 23. NEW YORK, DECEMBER 3, 1859. NEW SERIES.

IMPROVED MOVING TREAD POWER.

Here is the most novel affair that we have had in many a day. It is an entirely original method of applying muscular power to machinery, which will, no doubt, interest mechanicians.

The plan is to set one foot on a band, so as to hold it firmly, and then push the machine along so as to draw out the band from the machine, and thus revolve a shaft about which the band is wound. On lifting the foot, a spiral spring draws the band in; the other foot, meanwhile, operating to draw another band, and thus the shaft is kept in constant motion. The accompanying engravings represent the power applied to a reaping-machine; Fig. 1 being a perspective view of the whole, and Fig. 3 a section of the shaft, pulleys, &c. A is the strap which is in operation, and B is in the act of being relieved from the pressure of the foot, when it will be drawn by the action of the spring, and wound around the shaft. The drum on which the strap is wound is loose on the shaft, and has the pawls, *b b*, pivoted to its side. These pawls catch in the ratchet wheel, *a*, which is fastened firmly to the shaft, so that when the drum is caused to revolve by drawing out the belt it rotates the shaft; but when the spiral spring turns the drum in the opposite direction, the pawl slips over the ratchet, and produces no action upon the shaft. A bevel gear, C, in the middle of the shaft changes the direction of the motion in the machine here illustrated, in order to rotate the cutters. Instead of these revolving cutters, of course, the ordinary reciprocating cutter may be used, if preferred. A loose band passes from the end of one of the thills to the end of the other, and the operator, by leaning against this band, applies his strength in an effectual manner to push forward the machine. In employing horses, ropes may be used instead of straps. They are tied to the animal's fore feet; the horse being harnessed so as to push the carriage before him; or, if deemed preferable, an arrangement may be made to harness the horse in the usual manner, so as to travel before the carriage. In this case, rods are suspended below the shafts so as to bring their ends near the ground, and near the horse's fore feet. Pulleys are pivoted on these ends, and and the ropes or bands being brought from the driving-shaft, are passed over the pulleys and fastened to the horse's hind feet. By either of these modes of harnessing, this plan of applying muscular power may be adapted to a horse-power; the horse to travel at the end of a sweep about a shaft, and the revolving shaft first described to extend along the sweep to the upright shaft at the center

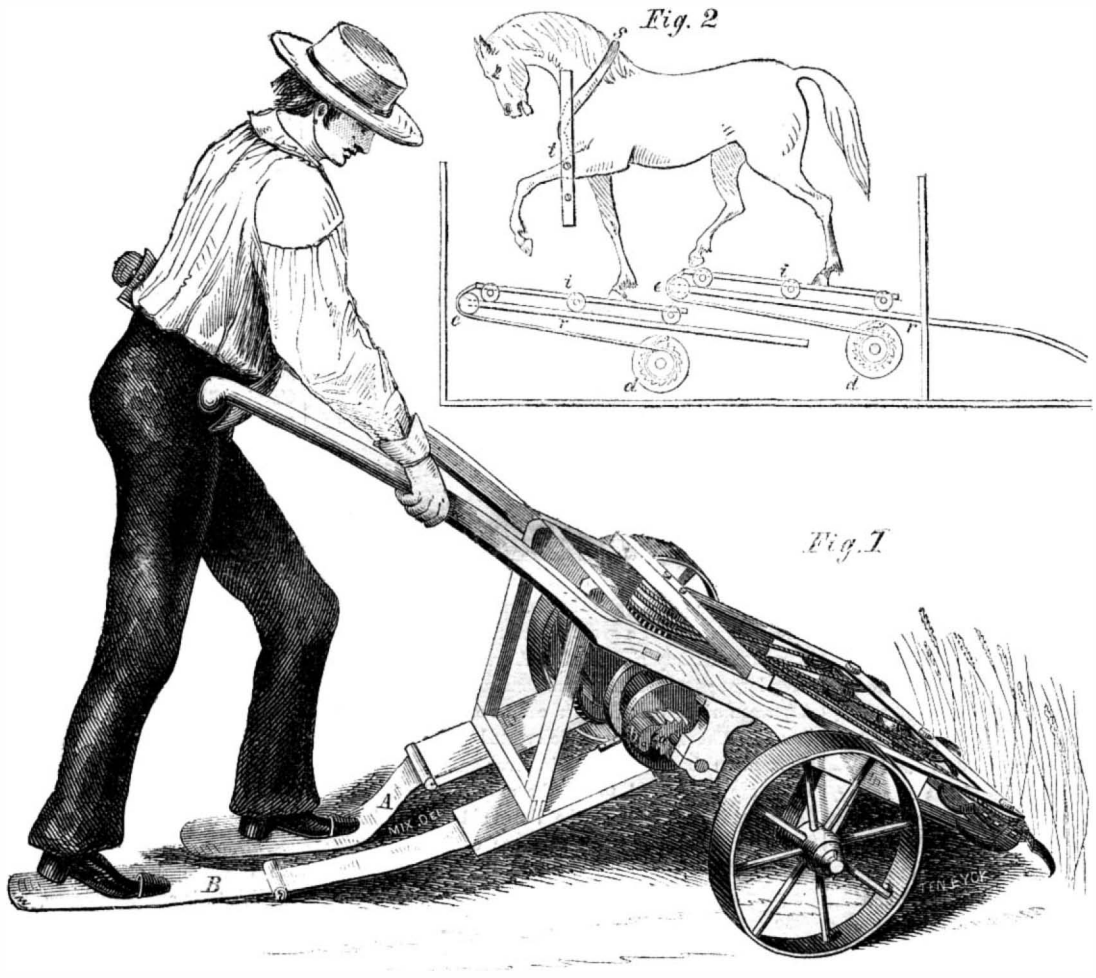

Fig. 1

KOCH'S IMPROVED MOVING TREAD POWER.

Fig. 2 represents a plan for applying this invention to a horse-power, in which the body of the horse is stationary and horizontal, each pair of feet moving on a separate inclined plane. The driving-shafts, *d d*, are similar

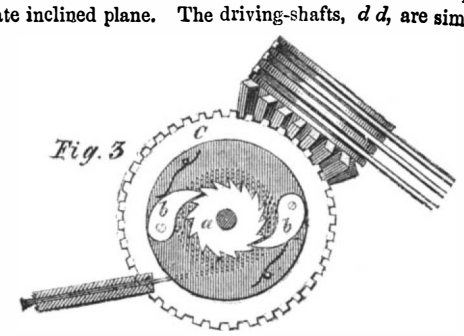

Fig. 3

to those represented in Fig. 3, and the straps passing over the pulleys, *e e*, are fastened to the platforms, *i i*, which rest on rollers upon the inclined planes, *r r*; there being one of these platforms and straps, of course, for each foot, and the platforms having a reciprocating motion up and down the inclined planes as they are drawn by the action of the horse's foot, and released by lifting it from them. The horse's shoulder is pressed to the collar, *s*, which is firmly held in place by the support, *t*, and thus the muscles have full power in working the limbs.

Fig. 2

The inventor of this remarkably original contrivance is Louis Koch, of this city, whose patent was issued Oct. 25, 1859. All inquiries in relation to it may be addressed to Koch & Torstrick, 26 Broad-street, this city.

NEW MATERIALS FOR PAPER.

A few years since, when rags were very scarce and high in price, much attention was bestowed upon obtaining some cheaper substitute. Various new substances were suggested, and quite a number of parties made experiments, and constructed machinery to produce paper from wood; and some very excellent specimens were manufactured from pine shavings. It was found, however, that when rags fell somewhat in price, the processes involved in making paper from wood were too expensive; and, besides, the paper was too brittle for printing, unless mixed with some cotton pulp. The excitement about getting a substitute for cotton rags seems mostly to be considered in the light of a commercial spasm, which came and went, leaving things just as they were before. This, however, we are happy to say, is not the case; that excitement has developed good fruits. Of all the substitutes which have been tried to take the place of rags, straw has hitherto secured the best results. The Philadelphia *Ledger* has been printed for five years upon paper which contains a large per centage of straw; the New York *Sun*, and several other daily papers, are printed upon such paper; and its manufacture has now reached four and a half million pounds per annum. It is true that it does not make paper of the first quality; but it is very suitable for the purposes to which it is applied.

In addition to straw, another new material for paper claims our attention; it is that of the sorghum saccharatum—the Chinese sugar cane. Paper from its stalks, after the juice was expressed from them, has been made by Mr. M. Nixon, at Manayunk, Pa., and the Philadelphia *Ledger* has recently been printed upon it. It is somewhat whiter than that obtained from straw, and is of very good texture; it contains 75 per cent. of the cane pulp and 25 per cent. of rags.

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THE CONSTRUCTION OF STEAMSHIPS.

MESSRS. EDITORS:—As your paper is devoted to the advance of science and art, in their adaptation to the wants of society, permit the writer to occupy a portion of your columns in calling attention to ships and ship-building, more particularly steamers.

The columns of most of our papers have been filled, *ad nauseum*, with the *Great Eastern*, her performances, speed, &c., &c., and the result seems to be that, after all that has been said and sung in praise of her projectors, architects, engine-builders and managers, she is, if not a failure, far from a success. The writer could set forth many reasons, conclusive to him, that the *Great Eastern* must, of a necessity, prove a commercial failure; and the conclusions of "Tubal Cain," the correspondent of the New York *Times* (who is a practical engineer), would seem to be as conclusive as regards her speed. With her present engines and boilers, she can never be a fast ship, except at an expenditure of fuel that will make her an unprofitable one; and even at the estimate of 300 tuns per day consumption of fuel, the entire capacity of the ship will be required to coal her for the outward and homeward trips on an East India voyage. Until it can be proved that, from some peculiarity in her lines of displacement, she requires less power to drive her than ordinary vessels, all expectations of decreased expense in her performance, as compared with other ocean steamers, will prove utterly baseless. But enough of the *Great Eastern*. No proof, as yet, has been adduced to show that, tun for tun of carrying capacity, she can be navigated at the same speed as the Collins or Cunard line, at less expenditure of fuel; and hence, basing opinions on the best information we have, the ship has, in no particular, equaled the expectations or hopes of her projectors.

But, Messrs. Editors, are these any reasons why all attempts to arrive at more satisfactory results than any yet attained, in speed, economy of fuel, safety, and general adaptation of means to certain ends, should be abandoned? Perfection in steam navigation on the ocean has not, as yet, been reached. May we not adopt the language of Sir Walter Raleigh? "Whoever was the inventor of ships, every age has added somewhat to them; and, in my time, they have been greatly bettered." It is scarce half a century since steam was first successfully applied to navigation, and less than half that time since the dawn of ocean steam-navigation. Let prejudice be laid aside, let models and plans receive the attention they merit, let us cease to pin our faith on the sleeve of English or European projects or experience; and then Yankee ingenuity will very soon, under suitable encouragement, solve the great problem, and produce a vessel combining all the requisites of safety, strength, speed, and economy in fuel.

The chief obstacle (in the opinion of the writer) in the way of attaining increased speed in ocean steamers, arises from faults in model and mode of construction, quite as much as in the means of propulsion. Steamers must be built so as to secure great buoyancy, in order that they may not load too deep, or light up too fast by the consumption of fuel and stores. Model a steamer so that the quantity of coal she is to consume in any ordinary voyage will not sink her down over one foot, and the consequence will be that, from the commencement to the termination of a passage, she will be in trim to attain all the speed of which she is capable or her engines can give. This most important feature in the construction of a steamship has been thus far overlooked. Build a ship of say 450 feet in length, 56 feet breadth of beam inside the paddle-boxes, with not more than 22 feet depth of hold, with a long flat floor, and small dead rise; a vessel thus constructed will not sink at her load-lines (14 feet) more that one inch for every 100 tuns of coal placed on board; and as her consumption of fuel, in ordinary passages across the Atlantic, will not exceed 1,000 tuns, at the utmost, it follows that she will not be sunk so as to load her wheels at the commencement, nor lighted up at the termination of a voyage so as to prevent her engines acting with full power and efficiency.

A vessel constructed of the dimensions above stated would have a tunnage (carpenter's measurement) of over 7,000 tuns, and would have a carrying capacity fully equal to the coal she would consume in a passage across the Atlantic (stores and water included), and stowage room for over 2,000 tuns of weight and measurement goods; and, with engines of properly graduated power, could be driven with safety at a speed of 17 knots per hour in an ordinary sea-way, making the passage from here to Southampton, in all ordinary weather, inside of eight days, on a consumption of coal not exceeding 800 tuns.

Place the engines of the *Persia* or the *Adriatic* on board a vessel built on the proposed model, and she will make the distance between New York and Liverpool in less than eight days, because she will always be in trim for acquiring all the speed her engines are capable of imparting; no portion of their power being lost by too deep or too light submergence. Such a vessel would be a light, buoyant, easy sea-boat, not shipping seas constantly, like the *Persia*; nor rolling channels under, like some other ocean steamers not necessary to mention.

The success of such a vessel is not a mere matter of conjecture. A large steamer built on the same lines, now running on Lake Erie, with a single engine 12 foot stroke and 76-inch cylinder, makes regularly 18 to 20 miles per hour on a consumption of 40 tuns of coal for each 24 hours. The short, chopping seas of Lake Erie will deaden and impede the headway of a steamer more than the ordinary swell of the Atlantic; and if the universally conceded opinion of nautical experts may be deemed any proof of the feasibility of what is claimed in the above statement, all that is wanting to give the United States the commercial supremacy of the ocean is the means to construct and equip a vessel on the plan and model of the projector.

The merchants and capitalists of Great Britain expended over $7,000,000 in the experiment of the *Great Eastern*; can there be found, in the city of New York, enough of local or national spirit to vest $500,000 (less than one-fourteenth part of the above sum) in the construction of a steamer that will place America foremost in the strife, distance all competition, and restore the lost *prestige* of the stars and stripes?

NAUTICUS.

New York, Nov. 28, 1859.

AMERICAN STEAMBOATS IN RUSSIA.

MESSRS. EDITORS:—During my three years' stay in Russia I have constructed a great number of steamers, mostly for the Caucasus & Mercury Steam Navigation Company, one of the most flourishing companies in Russia; their steamers are commanded by officers in uniform. It is indeed a great pleasure to take a trip with them from Nishny Novgorod to Astracan. I have built three large passenger steamers constructed similar to the American river boats, with cabins on deck, and wide guards. These steamers have created a great deal of excitement on the Volga, both in favor and against them. They are considered to be the most comfortable and finest-looking steamers on the Volga; but from inexperience in managing them, they are considered by the Caucasus & Mercury Company to be not steady enough for passengers, which erroneous objection has given me some trouble, but it is now partly and shall be fully proved that the steamers are perfectly safe.

On the first trip with one of the steamers, from Nishny Novgorod to Astracan, it was in the beginning considered satisfactory, but when the passengers moved to one side of the steamer, it leaned over a little; the captain, not knowing how to trim it, got frightened, thought the steamer would capsize; and said he would not be captain any more on that boat! The passengers, hearing this, of course got frightened also; but there were some passengers on board who had been to sea, who encouraged others and said "There is no danger." In such a state of confusion and excitement the steamer arrived in Tsaritzen, where I met her for the first time in her finished state; this was in the middle of July, last summer. As the contractor of the steamer everybody complained to me; I soon found out the mischief, and promised "It shall be steady hereafter," for which purpose I went with her to Astracan. I had provided for each steamer a chain box or carriage by which to trim it to an even keel on the water, similar to those generally used in America. When I asked the captain for the chain box, he did not know *what* or *where* it was, although it had been described in the specification of the steamers to the company. I found the chain box among the firewood and rubbish, in the fore part of the boat, and requested one of the directors of the company to put the chain box in operation, when I received the odd answer that "The captain on board is a very nice gentleman; he knows very well what to do," &c. I repeated my request, but received only feeble excuses in return. The passengers locating themselves on one side of the boat in order to get into the shade, the steamer leaned over a great deal, and I felt very uncomfortable indeed, meeting steamers, passing cities and villages with our floating palace in a position like the tower of Pisa, having the proper means on board to trim it but not being able to do so in consequence of the obstinacy of a director. On our return from Astracan I succeeded in putting the chain box in operation, after which the steamer was kept perfectly level on the water. It was, however, reported that American steamers are very dangerous; that they will capsize in a high wind; and that it would be well if the government (Russian) would prohibit their employment on the Volga! Although I am Consulting Engineer to the Caucasus & Mercury Company, and although I constructed the steamers, my opinion is not taken, and they have no Chief Engineer in their service, but the report is entrusted to a non-professional man, and from his ignorance the steamers were rejected. Fortunately, here are people of better sense and judgment, who got hold of the steamers, and they are now running with perfect success between Nishny Novgorod and Astracan. There will be no more complaints of the steamers being crank; and I am engaged to build more of them this winter, of precisely the same pattern.

The steamers in question were built in the government of Kaluga, at his Excellency General Maltsoff's establishment, Ludinoff, where I shall build some more steamers this winter, of which two will be propeller steamers for the Black Sea, and perhaps one for the Caspian Sea. The government of Kaluga is about the highest part of European Russia; many rivers commence about here and run in different directions to the seas. Steamers can be built here and sent by the rivers Desna and Dnaper to the Black Sea; by the rivers Oka and Volga to the Caspian Sea; and by the Canal and Lake Ladoga to St. Petersburgh and the Baltic. On his Excellency General Maltsoff's estates there is plenty of iron ore, wood, and even stone coal. In traveling through the *steppes* and wilderness of Russia it is quite surprising to arrive on General Maltsoff's land. From the number of manufactories and smoking chimnies in every direction, one might think himself in England or America. It would, indeed, be a fortunate thing for Russia, if there were more such landholders in the empire. Most of the landholders in Russia live and amuse themselves in St. Petersburgh, Moscow, or some other large city; perhaps many have never seen their estates, while his Excellency General Maltsoff lives on his estates and takes care of them in person. The general is more like a go-ahead Yankee than like a Russian. He makes a great many experiments and spares no expense in accomplishing a good thing. General Maltsoff has twelve blast furnaces, one mechanical establishment with plenty of the best English tools and machinery, sufficient for 1,000 workmen; one large glass manufactory; a great number of sugar works; a linen manufactory; one establishment for galvano-plating bronze and Britannia-metal ware; enameling works; brick works; a great number of flour mills and sawmills driven by water, wind and steam; agricultural implements of the best and latest improvements; four large rolling mills; a China-ware manufactory; a distillery; Champagne and other wines made from Crimean grapes of the general's estate, at Semis, &c. Most of the manufactures are sent to Moscow and St. Petersburgh, though large quantities are sent in barges to the Black Sea, to Nishny Novgorod, and to the Caspian Sea. General Maltsoff takes upon himself the chief direction of the whole, to the minute details of every department.

Will you have the kindness to state in the SCIENTIFIC AMERICAN, that my address will be to the care of the American minister, St. Petersburgh, until next summer, when I shall return to my adopted country, and reside in Philadelphia, which will of course thenceforth be my place of address.

JOHN W. NYSTROM.

St. Petersburgh, Oct. 18, 1859.

THE NASMYTH HAMMER.—We are informed by Messrs. Merrick & Sons, of Philadelphia, who are manufacturing this famous hammer, that the English fee for its use is now entirely abolished. Their advertisement in relation to it will be found in another column.

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IMPORTANT HINTS ON VENTILATION.

BY E. M. RICHARDS, C.E.

[Written expressly for the Scientific American.]

Air is more necessary for our existence than any other substance provided for our use by bounteous nature. Man can live longer when deprived of any other requisite than this; if put into a vacuum, he dies almost as quickly as if shot through the heart, and if compelled to breathe poisonous gas in a concentrated form, the same result ensues. Most people know this, but very few are aware (if we are to judge by their acts) that the partial deprivation or vitiation of the breathed air will cause injury to the health of the individual, no less certainly than the total loss of it will produce death as above stated.

The atmosphere is essentially composed of two gases called oxygen and nitrogen, in the proportion of 1 part of the former to 4 parts of the latter. The oxygen is the portion that supports animal life and combustion; the presence of the nitrogen is required to dilute the oxygen, and prevent its too active properties from affecting us injuriously. At each inspiration a certain quantity of air is taken into the lungs, one-fifth of which is oxygen; this gas, by its contact with the blood, restores its vitality, which was impaired by its circulation through the body, and sends it on again in its never-ending journey, giving life and power to all parts of the frame. When the air is breathed out again, the nitrogen is apparently unchanged, but the oxygen is no longer possessed of the life-giving properties it had before its entrance into the lungs; by combining, in part, with a certain matter in the body called carbon, which comes from the food, it is converted into a very noxious substance—diluted carbonic acid gas. The attempt to breathe this air, when pure, would cause death; taken when largely mixed with atmospheric air, however, it may be inhaled, but the effects produced by it resemble those of apoplexy.

Though we are thus constantly manufacturing a deadly poison, we are, by a most beautiful and benign provision of our Maker, shielded from its bad consequences. The out-going breath is always considerably heated; this makes it lighter, and causes it to ascend over our heads; when we are out of doors it is rapidly carried away, and is in time purified by another process no less beautiful. If our houses were properly constructed, this constant carrying away of the foul products of respiration would always go on, and we should never suffer any more inconvenience from them than when out in the open air. But it seems that it is hard for us to learn nature's laws; for, with an intense stupidity that in future times will appear incredible, we have, almost without exception, constructed our edifices so as to retain that very poisonous gas under consideration, and thus frustrate all its endeavors to rise and fly away from us. It is true that its bad effects are not so readily visible when largely diluted (as is generally the case), especially when we have been much in the habit of inhaling it; but it is none the less surely undermining our health, and laying the foundation for future disease and premature death. Most of the readers of the SCIENTIFIC AMERICAN have read or heard of men losing their lives from going down into wells where foul gas was present in large quantities; but they may not be so well aware that the same gas is likewise doing its deadly work, though more slowly, in ninety-nine out of every hundred buildings in the land. The following are a few examples of the effects of living surrounded by this poison:—

In the Dublin Lying-in-Hospital, in 1781, every sixth child died within nine days after birth, of convulsive disease; but after means of thorough ventilation had been adopted, the mortality in the five succeeding years was reduced to nearly 1 in 20.

In the Island of St. Kilda, in 1838, eight out of every twelve children died between the 8th and 12th day after birth; the great, if not the only, cause being the filth in which they had lived and the noxious effluvia which pervaded the houses of their parents.

Dr. Bell says that an action (brought by the commonwealth) ought to lie against those persons who—either for sale or to rent—build houses containing rooms constructed so as not to allow of free ventilation; and that a writ of lunacy should be taken out against those persons who are willing to occupy them.

Dr. Andrew Combe, the great and popular physiological writer, says that one cause of convulsions is the breathing of impure air; and he gives it as his opinion that bad food and deficient clothing are not to be compared with the constant inhalation of a vitiated atmosphere, for injurious effects on children.

Mr. Carmichael, writing in 1810, stated that the extreme prevalence of scrofula in the Dublin House of Industry, was to be accounted for by the fact that the children always slept in a frightfully impure bed-room, and that the air of the rooms they occupied in daytime was very little better.

Mr. Ritchie, in commenting on the diseases produced by vitiated air on shipboard, states that climate is blamed for every disease that appears in foreign stations; but he declares himself convinced that the want of a thorough method of ventilation on shipboard has, in very many cases, laid the system open to disease, which, in more favorable circumstances, could have been easily removed.

Bandelocque insists that impure air is the true cause—perhaps the *only* cause—of scrofulous disease.

Sir James Clarke gives it as his opinion that the public generally are most ignorant of the bad effects of foul air, and that it is more injurious to the growing body than defective food.

In an English parliamentary report it is stated that when the density of population and the affluence are the same, the rate of mortality depends on the efficiency of the ventilation.

It is the opinion of well-informed physicians that the greatest cause of that scourge of our race, consumption, is the habitual breathing of vitiated air.

Living in a pure atmosphere is just as necessary for the inferior animals as for man. It is stated that the glanders in horses, the pip in fowls, and a disease in sheep, are produced by a want of pure air; and also that £10,000 a year has been saved to the English nation by the army veterinary surgeons adopting a simple plan for the ventilation of the cavalry stables. The writer once knew a groom (said to be an intelligent one, too) who stopped up the foul air escapes of a stable under his charge, because "the circulation of air would injure the horses' coats!" This man was constantly obliged to doctor his horses for one disease or another. It is very likely his air-tight stable had something to do with the sickness of the animals inhabiting it.

Dr. Arnott states that many animals were killed at the Zoological Gardens, in London, by putting them into houses that had only an opening a few inches from the floor; it was like putting them under an extinguisher. Canary birds have been found dead in their cages in the morning after having passed the night hung up at the top of a large curtained bedstead, in which the foul exhalations from the sleepers below were retained. Bees take good care to have their hives well supplied with pure air, notwithstanding that the construction of hives is not favorable to ventilation, by a peculiar method of producing currents of air with their wings—one current to carry out the foul air and one to bring in the fresh. Their plan of operating is said to be highly interesting; they adapt the power of their ventilating apparatus to the existing circumstances of the case, as regards the number of active bees in the hive, the heat of the weather, &c. Bees thus show themselves to be better physiologists than are many of our large manufacturers, most of whose workshops are hardly better than hotbeds of disease on account of the noisome atmosphere within them.

[To be continued.]

REWARDS OF GENIUS.—It affords us pleasure to record the fact that both Stephenson and Brunel—the recently-deceased English engineers—had obtained considerable fortunes, and that they were not, like many other eminent men of by-gone days, suffered to live in poverty. It is related of Brunel that he was worth £90,000 (four hundred and thirty-six thousand five hundred dollars), and that Stephenson's personal estate amounted to £400,000 (one million nine hundred and forty thousand dollars). It is said of Stephenson that he was of a very kind and generous disposition, and that all his old workmen were devoted to him with the deepest affection. He left £10,000 to the Newcastle Infirmary, £7,000 to the Philosophical Society, £2,000 to the Mining College, £2,000 to the Institute of Civil Engineers, £2,000 to the Curate's Society, and a like amount to the Society for promoting Christian Knowledge. The greatest amount he has left to a cousin. He has gone down to the grave, the last of his race.

STATISTICS OF HEADACHE.

The *Medical Times and Gazette* contains some interesting medical data, obtained by inquiries made in the usual course of professional experience, concerning the causes of headache. Of 90 cases cited, 76 were females, a number which establishes pretty strongly the fact testified to by most of the old writers, that females are more frequent sufferers. Of the 76 females, 40 were single. The predisposition in the case of females is believed to originate in the nervous system—susceptibility of nervous disorder being much oftener found in the female than in the male subject. It is likely to exist in organisms which evidence a capacity of so much fineness and delicacy of perception, united with so much proneness to emotional excitement, and in which the functions of organic life are observed to be so readily wrought by passing states of thought, sensation and emotion.

Of the exciting causes, emotional disturbance has the highest number. Out of 90 cases, 53 declared this to be one of the causes of their attacks, 48 also considered that atmospheric states were to be blamed, and 25 specified thunder. In regard to inheritance of the liability, in 19 cases the mother is mentioned, in 9, the father, and in 12, both parents; in all, 40 gave explicit evidence of hereditary predisposition, and a few other mentioned cases in collateral branches. Out of the 90 cases, only 19 blamed their diet. As to the influence of climate, 29 seem very clear that they are least liable to attacks of headache in places where the air is dry and bracing; 6 commend cold atmosphere, and 6 condemn it; 8 praise warm atmosphere, and 3 dislike it; 6 are in favor of sea-air, and 4 are averse to it. Fatigue is mentioned as an exciting cause in 32.

THE GORILLA.—Some years ago, we publisned an account of the first discovery of this, the largest of all the monkey family; and last year we gave an account of the arrival in England of the remains of one of these rare animals in a state of putrefaction and of its examination by Professor Owen. Within a few weeks, M. Du Chaillu, a gentleman who was sent to Africa by the Philadelphia Academy of Sciences, has returned, bringing with him several skins and skeletons of the gorilla, with a large collection of African curiosities, which are now on exhibition at No. 635 Broadway, this city. He says that the statements made by Professor Owen, on the authority of those who caught his specimen, in regard to the intelligence of the animal, are greatly exaggerated; that it does *not* use a club as a weapon, but is, in fact, simply a brute. It is among the most formidable of animals, its arms being as large as some men's legs, and one specimen in M. Du Chaillu's possession measures 8 feet, 3 inches from tip to tip of its fingers when its arms are extended. It looks very much like some of the wild African tribe of negroes, and its skeleton bears a wonderful resemblance to that of a man.

COPPER-SMELTING. — Hitherto all the smelting of American copper ores have been conducted at but three places in our country, namely, Cleveland, Ohio; Baltimore, Md.; and Charlestown, Mass. Another new establishment has been added to the number, which is located at Bergen Point, N. J. Copper ore is being received from Chili, Cuba, Venezuela, Mexico, and various parts of the United States. Two or three mines in New Jersey are being worked successfully; Vermont is doing something like 100 tuns of copper ore per month; Tennessee has valuable copper mines, as yet imperfectly developed; also, Pennsylvania and North Carolina. Connecticut mines are doing nothing at present. Instead of obtaining a large proportion of our copper from Europe, as was the case a few years ago, this valuable metal is now an article of export.

FREE ADVICE TO INVENTORS.—It is the custom, at the office of this paper, to examine models or drawings and descriptions of alleged new inventions, and to give written or verbal advice as to their patentability without charge. Persons having made what they consider improvements in any branch of machinery, and contemplating securing the same by Letters Patent, are advised to send a sketch or model of it to the SCIENTIFIC AMERICAN Office, and obtain the opinion of the publishers as to the prospects of obtaining a patent. Such advice is rendered free by Messrs. MUNN & Co., Patent Solicitors, who have had fifteen years' experience.

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THE AVERY MONUMENT AND STATUE.

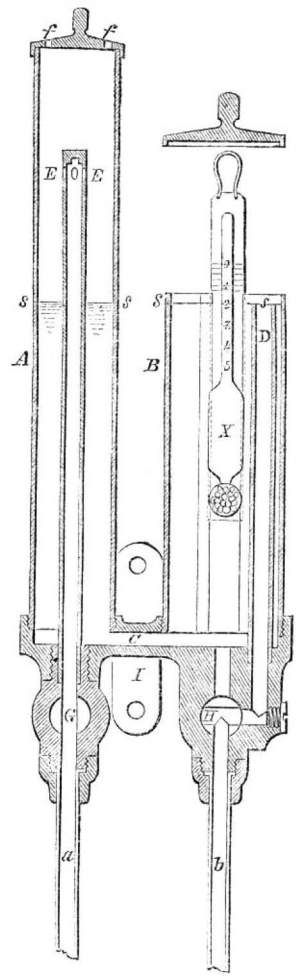
One of the most prominent citizens of Pittsburgh, Pa., was the Rev. Charles Avery, who died two years ago. He was a gentleman of great wealth, and noted for his benevolence, both of which were directed mainly to the relief of the negroes, principally in sending them to Africa; Mr. Avery being an active colonizationist. After his death, his friends determined to erect a monument to his memory; and the execution of the work was entrusted to Louis Verhaegen, a sculptor of modest pretensions though possessing superior artistic talent, formerly of Antwerp in Belgium, but now of this city. The monument will be 21 feet in hight; most of the pieces have been completed and forwarded to Pittsburgh; it is to be surmounted by a collossal statue of the deceased; the drapery of the figure is exceedingly well wrought, and represents the clothing of a past period; the hight of the statue is 10 feet, and its weight about 5 tuns, it is just finished and ready for shipment. Some gentlemen are trying to induce Mr. Verhaegen to have it exhibited to the public, before it is sent from this city; and we hope such an arrangement will be made. The artist's studio (310 Fourth-avenue) is not a convenient place to exhibit the statue; and Mr. Verhaegen does not like to assume the risk of having it removed until it is shipped to its destination, lest some accident might befal it. The whole monument, as well as the statue, is hewn out of blocks of Carrara marble; the former will be adorned by two female figures—one representing "Justice" and the other "Charity;" it will also be ornamented by an exquisitely wrought *bas-relief* embodying several figures, which represent Mr. Avery surrounded by negroes and pointing to a ship at anchor in the distance, as if in the act of designating the conveyance which will transport them to their native land. The face of the statue, when viewed from a proper point, is life-like, and is said (by Mr. Avery's acquaintances) to be an excellent likeness In the massive proportions of the statue, the predominating expression is that of majesty.

We re-iterate the hope that this genuine work of art will not be permitted to be sent from this city before all who desire to view it have had an opportunity. We will add that Mr. Verhaegen has executed, for some gentlemen of this city, several busts of distinguished statesmen; and those which we have seen are remarkable for their truthfulness of portraiture.

IMPROVED MARINE SALINOMETER

The water of the Atlantic Ocean contains about one pound of salt to 32 pounds of water, and when it is used in steam boilers, as the water is evaporated and the salt is not, of course that which remains is constantly becoming more salt, until a point is reached at which the salt begins to leave the water and form a crust on the bottom of the boiler. If the engineer knows when this point is reached, he opens the boiler and blows out this too salt water and replenishes his boiler with a fresh supply. The importance of informing the engineer of the degree of saltness of the water in his boiler has lead to the invention of instruments for measuring it, and it is an improvement in these instruments which is illustrated in the annexed cut. The salter water is the greater is its specific gravity, and this instrument is constructed on the plan of drawing some of the water from tne boiler and measuring its specific gravity by an ordinary hydrometer.

In the cut, *a* represents the pipe leading from the water in the boiler, G a stopcock in this pipe, and E E openings by which the water can flow into the cylinder, A. From this cylinder the steam is allowed to escape through the openings, *f f*, thus reducing the temperature of the water below the boiling point. From the cylinder, A, the water passes through the pipe, C, and rises in the cylinder, B, to the point, S, when it flows over into the top of the waste pipe, *b*, and passes away. The cylinder, B, is entirely open at top, and has the hydrometer, X, floating in the water which it contains. This hydrometer is a simple glass tube with a bulb at the bottom filled with shot, by varying the quantity of which the weight of the tube may be adjusted at pleasure. As the specific gravity of the water varies with the temperature, it is necessary to take account of the latter in making the observation, and in this machine the arrangement for this purpose is of the most convenient character. The neck of the hydrometer is divided on three sides in scales for measuring the degree of saltness of the water at three temperatures, 190°, 200° and 210°, embracing the ordinary range of the temperature of the water in cylinder, B. Each of these scales is marked at the point to which the hydrometer sinks in fresh water, O, at the point of Atlantic Ocean water, 1-32, at the point to which the hydrometer sinks in water containing twice as much salt as ocean water, 2-32, and so on. Consequently, al the



engineer has to do is to observe the thermometer and see to which of the three points, 190°, 200° or 210°, the temperature is nearest, and then look at the corresponding scale on the neck of the hydrometer, which tells him the degree of saltness of the water without any calculation being required. It will be understood that the hydrometer is marked and its weight adjusted to show the saltness of the water at various specific gravities, as this has been ascertained by previous experiment. By the arrangement here described all the ebullition takes place in the cylinder, A, and the water in cylinder, B, is tranquil, allowing the hydrometer to rest in it without oscillation or disturbance.

The patent for this improvement was granted to Robert H. Long, of Philadelphia, Pa., July 12, 1859, and patents have been secured in foreign countries through the Scientific American Patent Agency. Further information in relation to it may be obtained by addressing Joseph Grice, No. 96 Wall-street, New York.

INSECT INTRUDERS.

MESSRS. EDITORS:—Having perused, with much interest, an article entitled, "A Beetle in a Traveler's Ear," published on page 322 of the present volume of your inestimable journal, I herewith send you a simple, safe and effectual remedy or means by which insect intruders may be summarily ejected from the human ear. A few weeks back a beetle flew into my ear, and worked its way as far as it could—in fact, completely out of sight. A gentleman, commisserating my agony, took me to the nearest surgeon (Dr. Noble), who said, "I will have it out in a moment." After putting a white sheet around my neck, he told an assistant to hold the cloth, and watch for the bug when it would be forced out. He then, with a syringe, injected tepid water with force into the ear; the first push of the piston sent the water beyond the bug, and drove it with force on to the white cloth. In less than two minutes, without pain, I was relieved and had the bug before me. The surgeon then informed me that he had always been successful, and had once taken a full-sized roach from a person's ear. R. T. R.

Philadelphia, Nov. 26, 1859.

INDIAN HEMPS.—The East Indies is a wonderful country, and to it we are now indebted for many things essential to our manufacturing interests. It furnishes us with indigo and lac for dying blue and scarlet colors, catechu for tanning and coloring, and manilla and jute hemps for fibrous products. We import, annually, Indian hemp of all kinds to the value of $2,688,000, manilla being by far the largest in amount. Jute is the greatest fiber-producing plant of the East Indies, of which no less than 40,000 tuns are shipped annually to England. We do not use much of this hemp as yet, but its consumption is on the increase; for although it is not so strong as manilla, its low price is a great inducement to engage in its manufacture, especially as it makes excellent bed-cord and other small ropes not required to sustain great strain. Of this hemp 30,000 bales, amounting to about 4,000 tuns, are now imported yearly, most of which we understand is made into cord and bagging in the vicinity of Boston. There is also one jute factory in Brooklyn, N. Y., and another in Philadelphia, Pa. The fiber of this plant is from six to ten feet long, and it it is very glossy and almost white when uninjured. The town of Dundee, in Scotland, seems to be the focus of the jute manufacture, as it used up 30,000 tuns of it in 1858. It is there manufactured into various fabrics of cloth as well as bagging and cordage; and as India can supply inexhaustable quantities of it, it appears to us that its consumption must greatly increase among ourselves, as the wholesale price is only about three-and-a-half cents per pound—not half the price of common cotton.

GEORGIA RAILROADS.—Governor Brown, of Georgia, says in his late message to the Legislature, that the State has derived, the past year, $420,000 net profits from the Western and Atlantic Railroad, notwithstanding expensive repairs made upon it. He estimates the road to have cost the State $4,441,000. To the Atlantic and Gulf Railroad, $250,000 in State bonds have been issued, and $50,000 more shortly will be. The State issues $50,000 in bonds for every $60,000 paid in by the stockholders. He thinks well of the road, and still adheres to the opinion that State aid, in the way of endorsement and guarantee, might be judiciously extended to other roads, but only under conditions sufficient to insure the State against losses. He proposes to hold the stockholders liable to the State for every deficiency to pay interest or principle not met by the sale of the road.

ARIZONIAN MINING MACHINERY.—The silver mines of Arizona seem to be extremely inviting to our people. Several companies have become interested in such operations, and quite recently two steam-engines of 25-horse each, with stampers and other machinery for grinding and amalgamating, were shipped from this city by the Sonora Exploring and Mining Company, whose mines are located at Tubac. This was the first shipment of machinery, we believe, which has been made to that distant territory, and it was sent to Port Lavaca, Texas, thence to be transported by land carriage to its destination a distance of 1,500 miles. The total weight of engines and goods amounts to 50 tuns, and the cost of transport from this city to the mines, by contract, was no less than $15,000. The profits of silver mining are said to be very great.

EXAMINATION OF INVENTIONS AT THE PATENT OFFICE.—Through the Branch Office of the SCIENTIFIC AMERICAN, located directly opposite the Patent Office, Washington, D. C., we are enabled to make special examinations into the novelty and patentability of inventions. By having the records of the Patent Office to search, and the models and drawings deposited therein to examine, we are enabled to give an inventor advice, not only as to the probabilities of his obtaining a patent, but also as to the extent of the claim that it is expedient to set up when the papers for an application for a patent are prepared. For a special examination at the Patent Office, we make a charge of Five Dollars It is necessary that a model or drawing, and a description of the invention shall accompany the remittance. Address—
MUNN & Co., No. 37 Park-row, New York.

Quite a number of iron steamers have recently been built on the Clyder of running on the rivers in South America. They are of light draft, and intended principally for carrying passengers and light goods.

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THE MEASUREMENT OF HEAT.

The heat which a pound of coal can produce, either with or without light, is all that gives it its value. It is only in a rough, experimental way that we know how much heat any given description of coal is capable of producing; but it is substantially from what we do know of their calorific powers that the relative prices of all coals are regulated. Our knowledge, however, of the hidden powers of nature, of which heat is the greatest, is constantly increasing. The mechanical theory of heat is one of the greatest, and, at the same time, most beautiful additions to natural philosophy. With the aid of this theory we have been made comparatively familiar with one of the most intangible elements of force, and to deal with it in much the same way as with visible, ponderable matter. This kind of knowledge is calculated to remove much of our conceit; for, while we have been boasting of the perfection of our steam machinery, it shows us that we are hardly utilizing one-twentieth of the actual power residing in the fuel which we burn in our furnaces. Such knowledge as this is invaluable as leading to improvement, and every step in modern steam-engineering shows the advantages which it is capable of conferring.

The relation between the quantity and intensity of force of all kinds is another important branch of knowledge in which great progress is being made. Electricity, the best suggestion of imponderability, is already measured quantitatively, and in its intensity or range of momentary action. The distinction between absolute quantity and the mere density or pressure of steam is well understood, and the steam gage, simple as it is, is one of the finest examples of our resources for the measurement of the invisible sources of power. Mechanical power itself is frequently weighed, and the use of the dynamometer is likely to become general.

In respect of heat, our definite knowledge of its intensity in the various processes in which high temperatures are employed, has been generally very deficient. Beyond the thermometer, employed almost entirely for the measurement of atmospheric temperatures, we have rarely consulted any instrument capable of showing the higher ranges of thermal action, or such as occur in nearly all our applications of artificial heat. Of the heat in a steam-boiler furnace we seldom know anything. It is only very rarely that we know the temperature of boiler flues. Nobody knew anything of the heat existing in the funnels of the *Great Eastern* on the occasion of the explosion, and whilst there are those who believe they were never heated above 325°, there are others who stoutly affirm that they were heated beyond 1,000°.

Soyer always maintained that there could be no good cooking where the scales, the watch and the thermometer were not in constant reference. These instruments are as essential to steam-engineering as to cookery. We already weigh our coals and time their combustion, but we shall never properly apply the heat derived from them until we can measure its intensity at every moment. It is for this that we must use pyrometers, not experimentally and exceptionally, but practically and constantly, as we do weighing-machines, clocks or steam gages. There are many who believe that we should indeed measure and always refer to steam by its temperature merely, and not by its pressure. It has been shown, with considerable force, that, under such a system, steam-boiler explosions could hardly ever occur. However this may be, heat gages should be in constant use in our furnaces, or rather in the escaping-flues, and in all apparatus where high temperatures are employed. The pyrometer introduced by Mr. Gauntlett has already enabled many steam-boiler proprietors and owners of hot-blast furnaces to effect a considerable saving in fuel by maintaining equable firing, and as the knowledge of this and similar instruments extends, further and most important advantages are likely to ensue.—*London Engineer.*

RAIN AND PAINT PHENOMENA.

MESSRS. EDITORS:—On Sunday morning, Nov. 13, 1859, at 10¾ o'clock, a rain storm commenced from the south-west, which changed the color of two houses situated on the west side of Little Neck Bay, and also one at Hunter's Point, L. I. The effects were similar to that of dilute sulphuric or muriatic acid when poured upon a newly-painted surface. Those houses were painted in light and dark drabs, and were finished in April, May and June, 1859 One would have supposed that they had been entirely spoiled; for they looked like old weather-beaten crafts, and the painters, of course, were immediately blamed by the owners. I noticed that, when the rain commenced, it was warm upon the face and hands; and the rain came with a very sudden dash, like water forced violently through a sieve. The most remarkable part of this story remains to be told. Another rain storm followed some days afterwards, from the opposite point—north-east—when, lo! it restored the paints on these houses to their original colors.

Several buildings at White Stone, L. I., on the southern shore of the East river, which had been painted with the same color, were not the least affected by this rain storm. I do not know whether the phenomena was confined to Long Island, or had been witnessed in other places. It may be accounted for by currents of atmospheric electricity, carried with the rain over the surface of the paint. As opposite currents of electricity produce heat and cold alternately, a positive current first sent over the face of a wet painted board, and this succeeded by a reverse current, will sometimes produce effects similar to those stated in the foregoing. J. Q.

Flushing, L. I., Nov. 28, 1859.

HORSE-TAMING.

It appears that Mr. Rarey, our countryman, is still astonishing the natives of the British Isles with his wonderful power of taming the wildest studs and making them gentle as lambs. A short time ago he made a journey through Scotland, and several very vicious animals, which had defied all the arts of some of his pupils to subdue them, were taken in hand by the professor, and mastered with his usual consummate ability and success. By the latest account from Europe we learn that he is in Ireland, putting the lively Irish nags through his American process, and making as *dacently*-behaved beasts as are to be found on *terra firma*. Mr. Rarey has a peculiar personal power in taming horses, which none of his pupils have acquired fully. In a late exhibition given by him in Dublin, he induced a rather fiery unbroken horse to stand quietly while a large drum was mounted on his back and beaten. This horse, which never before had a rider upon his back, permitted Mr. Rarey to mount him; and the whole assembly were in raptures with the American horse-tamer.

A REMARKABLE FACT.—Professor Mitchell, in his lectures on astronomy, has related a very remarkable fact. He said that he had met, not long since, in the city of St. Louis, a man of great scientific attainments, who for 40 years had been engaged in Egypt in deciphering the hierogylphics of the ancients. This gentleman had stated to him that he had lately unraveled the inscriptions upon the coffin of a mummy, now in the British Museum, and that by the aid of previous observations, he had discovered the key to all the astronomical knowledge of the Egyptians. The zodiac, with the exact positions of the planets, was delineated on the coffin, and the date to which they pointed was the autumnal equinox in the year 1722, before Christ, or nearly 3,600 years ago. Professor Mitchell employed his assistants to ascertain the exact position of the heavenly bodies belonging to our solar system on the equinox of that year, (1722, B. C.,) and send him a correct diagram of them, with out having communicated his object in doing so. In compliance with this, the calculations were made, and to his astonishment, on comparing the result with the statements of his scientific friend already referred to, it was found that, on the 7th of Oct., 1722, B. C., the moon and planets had occupied the exact position in the heavens marked upon the coffin in the British Museum.

CORRECTION.—In Mr. H. O'Rielly's letter on the "Liquefaction of Flint in Water," published on page 346 of the present volume, several words were omitted in the "copy" furnished by the author, who has since sent us the correct phraseology which should have been expressed by the first paragraph in the second column of the above page. It should have read thus:—"Without dwelling on the extent to which Mr. Hardinge's views were stimulated by the operations of those humid volcanoes—safety-valves for the thermal operations of nature's great geological laboratory, and without discussing his views concerning the origin of rocks from the first gaseous elements through the fluid, semi-fluid, semi-solid to the solid granite, where Hugh Miller began his "Testimony of the Rocks;" thence through the metamorphic changes and combinations down to the tertiary and quaternary formations, I take pleasure," &c.

DETECTING COUNTERFEIT SILVER COIN.—When a sheet of silver is plunged in a solution containing 1½ part of bichromate of potassa, and 2 parts of sulphuric acid, it becomes quickly covered with red crystals of bichromate of silver; but this beautiful coloration is not produced with the other metals nor with silver money very rich in copper. It is useless to plunge the whole of the suspected piece in the liquid. A drop of the liquid applied to the metal is sufficient to give a result; but when the coin is recently made, or if it is presumed that it has been covered with silver by a galvanoplastic process, it is sufficient to scrape off a small portion with a knife and touch with a drop of the liquid. If the surface is nearly pure silver, the alloy beneath is seen to preserve its metallic lustre in the midst of a red formed by the silver of the surface—*Polytechnic Journal.*

ACCUMULATION OF COTTON.—We have heretofore mentioned the fact that all our cotton sheds were filled, and all the available space on the bluff and elsewhere were occupied by cotton awaiting transportation. We were informed yesterday, by the officers of the Memphis and Charleston Railroad, that their yard contains 7,000 bales of the staple, and that 2,500 were being received daily. They have room at their depot for only 10,000 bales, and this accumulation is putting them to serious inconvenience. Their were eight or nine boats loading with cotton at the levee, last evening, yet the imports seem to equal the exports.—*Memphis* (Tenn.) *Avalanche, Nov. 16th.*

DANGER OF READING BY TWILIGHT.—The London and Edinburgh *Philosophical Magazine* contains an account of the sudden loss of power to distinguish colors, produced by straining the eyes under a very feeble light. It says:—"A sea-captain, who was in the habit, when time hung heavy on his hands, of occupying it by working at embroidery, was one afternoon engaged upon a red flower, and being anxious to finish it, prolonged his labor until twilight came on, and he found it difficult to select the suitable colors. To obtain more light, he went to the companion-way, and there continued his work. While thus taxing his eyes, his power of distinguishing colors suddenly vanished. He went upon the deck, hoping that an increase of light would restore his vision. In vain. From that time to the present (more than ten years) he has remained color-blind."

MONTREAL VICTORIA BRIDGE.—A train consisting of an engine and a single car passed over this great bridge on the afternoon of the 24th ult. There were about 50 persons in the car, among whom were A. M. Ross, Esq., Chief Engineer, and several of the directors. The time of passage was 12½ minutes, it was a mere test experiment, as the bridge is not yet quite finished. The passage of this, the first train, we understand, was gratifying. It is expected that the bridge will be completed and opened to the public for traffic about the latter part of this month.

FUEL FOR EGYPTIAN LOCOMOTIVES.—There are now over 300 miles of railroads in Egypt. A foreign correspondent gravely states that, on some of these lines, the engine-stokers burn "mummies" for fuel, that the latter make a very hot fire, and that, as the supply is almost inexhaustible, they are used by the "cord." The firemen of those engines must have no *tender* feelings for departed greatness. What a destiny for the Egyptian Kings! Think of your body being carefully preserved for three thousand years, and then used to "fire up" a locomotive! "To what base uses do we come at last!"

BEWARE OF MUSK-RAT HOLES!—Three years ago some musk-rats burrowed in the banks of the canal at Blackrock, N. Y., and the water flowed through and at last carried it away, causing a flood in the adjacent creek which destroyed a saw-mill, and floated off a great quantity of logs. The owner of the mill sued the State for damages, and has received $3,500.

IRON WORKS.—From a table recently compiled by the American Iron Association, we find that there are only eight States destitute of iron works, viz.:—Mississippi, Louisiana, Florida, Texas, Iowa, Minnesota, California and Oregon. There are 1,545 works, 882 furnaces, 488 forges and 225 rolling mills, which produce annually about 850,000 tuns of iron, the value of which, in an ordinary year, is $50,000,000.

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CATCHING WHALES.

The Boston *Journal* publishes the following interesting information in reference to the whale-fisheries:—

"In 1834 the whole number of vessels engaged in this business was about 700, of which 400, or four-sevenths were American vessels, and 300 or three-sevenths, were foreign; so that 25 years ago, American enterprise was ahead of the rest of the world as four to three. In 1859 the whole number is estimated at 900, of which 661 are American and 239 foreign, showing American enterprise still more in the ascendant: for we have added 261 ships to our fleet, a gain of 65 per cent; while our competitors have fallen off 61 ships, a loss of 60 per cent.

In the value of the catch, the increase is still greater, being about $12,300,000 in 1859, against $4,500,000 in 1834—about 175 per cent. This, however, is in a great measure owing to the advanced value of oil and bone, the comparative statement of the quantities being as follows:—

1834.	1859.
Sperm oil, bls. 95,000.	Sperm oil, bls. 193,300.
Whale oil, bls. 146,500.	Whale oil, bls. 153,800.
Bone, lbs. 1,175,000.	Bone, lbs. 1,538,000.

But it is also in part owing to the great relative increase of sperm oil taken—over 100 per cent—while the increase of whales is only 5 per cent.

"Of the ships employed in this business, from this country, nearly, if not quite four-fifths are owned in and fitted from Massachusetts ports, producing to that State an annual income of about $10,000,000, giving employment to 12,000 seamen, and as many landsmen, besides yielding a large profit on the invested capital.

"The pursuit of whales in all latitudes, including the very extremes of heat and cold on the same cruise, is the most hazardous, and, with occasional exceptions, the most tedious of any occupation men are engaged in. It requires courage, skill, endurance and tenacity of purpose, to insure success, more than are necessary in any other vocation. Scarcely any other voyage requires a year, and every man knows when he ships where he is going, just what he shall have to do, and when he will will be back again; but the whaler only knows that he is off to the uttermost parts of the Southern Ocean, probably not for less than two and possibly for four years; it may be to come home with a goodly sum to his credit for his share of the spoils, or with not enough to pay half the common seaman's wages in the mean time; for months at times to roll lazily about on the ocean, with not enough to do to keep the blood in circulation, and then to be roused all at once to stretch every nerve to the highest pitch, and enter with all the soul into the most ardent pursuit of the most dangerous game. But these very uncertainties, hazards, and shifting scenes are suited to our people, and it is therefore easier to fit out and man a whaler from our ports than from any other port in the world. The old Bay State may well be proud of her whaling fleet, of the enterprising merchants who own the ships, of the steady, skillful men who command, and the host of gallant seamen who man them. She may boast of her manufactures, of her commerce, of her schools and her charities, but either or all of these may be matched by others; while no other State, no other nation in the world, can show any thing to compare with her whale-catchers. Success attend them! In this business, which pre-eminently requires all the great qualities requisite to make up a true man, she stands out alone, far above all competition."

In addition to the foregoing statements of our cotemporary, we will add a few others regarding the British whale fisheries. In 1820 the number of ships in England and Scotland engaged in the whale fisheries of the Arctic seas was 156, the amount of oil obtained yearly was 18,725 tuns, and whalebone 902, tuns. Owing to the increased difficulty of catching whales, and the rapid extension of lighting streets and factories with gas, the whaling business was afterwards almost extinguished. The old vessels were sold for carrying coal, and an immense amount of property was sacrificed. Within the last few years, however, the business seems to be growing up again, even though vast quantities of of coal oil are now made and sold. It is believed that the whale oil, especially sperm, is still superior to all other unguents for the lubrication of machinery; hence, as vast quantities are required for railroads and other purposes, there is much to incite persons to engage in the whale fishing. Within the past few years the whale fisheries of Hull (the New Bedford of Old England), have put steam into requisition for whaling, and several ocean ships are now engaged in the Greenland and Davis' Strait fisheries. Auxiliary steam engines were first put into some of the old wooden ships, and this was found advantageous; then some iron screw steamers were tried, but they were built so weak that they could not stand the rough encounter with icebergs. The *Chase*, a strong American built ship of 558 tuns, was bought two years ago by a company in Hull, and fitted with steam-engines of 80-horse power, and her first voyage last year, (1858) was very successful to her owners. The use of steam enables British whalers to make one voyage to Greenland and another to Davis' Strait in one season, and it thus has advantages, but we do not think it would be very economical for the long voyages of our whalers to the Pacific. The town of Hull which sent out 60 ships to to the whale-fishing in 1818, with crews of 40 men each, does not send more than 20 ships to-day; hence, we may well say, Americans are the whale-fishers of the world.

FILE-CUTTING MACHINE.

MESSRS. EDITORS:—I read with some interest, on page 291 of the present volume of the SCIENTIFIC AMERICAN, your notice of the file-cutting machine of M. Bernot, of Paris, having been successfully used in England and on the Continent of Europe; it being essentially the same machine that I patented in England in 1854, and in the United States in 1855. I also read on page 333 of the above volume, some statements made by your correspondent, D. H. C., who is, I suppose, my friend, D. H. Chamberlain, the fruits of whose fertile inventive genius are often recorded in the United States Patent Office, and well known in scientific circles. As there are some errors in the statements of the above correspondent, I beg leave to correct them, as it may be inferred that my patent was *his* invention; and at the same time I will show, by my experience, the caution which is requisite to avoid losing the benefit of valuable inventions in Europe.

Mr. Chamberlain says, truly, that the machine which I patented possesses the same elements as the one exhibited by M. Bernot, and he adds that all that is essentially distinctive, new and useful in it was originated by himself and sold to me in 1853, and that it performed admirably. I vainly endeavored to cut a perfect file with the machine above alluded to; I also called to my aid skillful mechanics and other workmen, without producing a single merchantable file; therefore, it was abandoned. My own machine was the result of like repeated efforts and failures before I succeeded. As I still have the Chamberlain machine lying in a pile of old iron, the dissimilarity of the two machines will be apparent on comparing his with the illustrations of mine in the Patent Office Report for 1855. It is due, however, to Mr. Chamberlain to say that his machine contained some features from which I derived some aid in the construction of mine; but they were imperfectly developed and were by no means what I regarded as my most important points.

As Mr. Chamberlain says, I executed an order for several of my machines for a firm in England, and took them there with me. With the assistance of J. C. Cooke, a very ingenious mechanic whom I took with me, I also made further improvements on machines subsequently built in England. Mr. Cooke is now in this country making further valuable improvements on them. That my machine (which is essentially the Berhot machine) cut perfect files, I have the highest testimonials from distinguished manufacturers and consumers of files, both masters and operatives; but those machines could not be operated by the owners in Sheffield, where they resided, on account of the violent opposition of the File-cutters' Trade's Union there; hence they were compelled secretly to operate them in Manchester, to avoid a "strike" of all their numerous workmen, attended, perhaps, by personal violence.

A word further in regard to M. Bernot's French machine which is now attracting so much attention, and about the way the French patent was obtained. While I was in London, in the winter of 1843, preparing my patent papers through a solicitor, access was had to the papers without my knowledge; the description and drawings were copied *verbatim*; and to my surprise, a patent was issued in Paris before the English patent. M. Bernot's machine, with some modifications, is essentially mine, and in addition to valuable considerations received in France and Belgium, it has been sold by him to an English company in Bristol for $75,000; while, by reason of the loose forms of foreign patents, requiring no oaths, and the technicalities of English laws in enforcing contracts, I was deprived of important benefits.

H. HOTCHKISS.

Plainfield, Mass., Nov. 29, 1859.

P. S.—As a caution to other inventors in like circumstances, I would add that if my English patent been procured through the Scientific American Patent Agency, I should have avoided the loss of the French patent, which now I shall have to recover by foreign litigation.

H. H.

INDIAN CURIOSITIES.

A course of deeply instructive and interesting lectures on India was concluded at the Cooper Institute, this city. last week, by the Rev. Dr. Scudder, who was for many years a missionary in the East Indies, and intends to return again to that wonderful country. He stated that many of the rivers in southern India run under the surface. A subterranean stream flowed under the apparently dry sandy bed of the Milk river, near which he had lived, and which was so fierce in its torrent as to engulf the unsuspecting animals who chanced to venture on its seemingly safe surface. He took a long stride to the subject of jugglers to settle an important question: "Can snakes be charmed?" He answered in the affirmative, and proceeded to describe the musical operations of the snake-charmers, their transparent pretences to power over the venomous reptiles, his own experience in testing their capabilities, and the wonderful little animal (a species of weasel) which does not hesitate to grapple with the most voracious snake. The Hindoo holy books he dated as far back as 1,400 years before Christ. The immensity of their vernacular and Sanscrit compilations on almost every imaginable subject he considered marvellous. As an illustration of the extraordinary rapidity with which they wrote—even with their rude materials, he mentioned that he had known school-boys to report a sermon as fast as the missionary could deliver it. As an evidence of the highly elevating tendency of a portion of their literature, he recited a number of maxims, among which were the following:—

"Sweet is the pipe; sweet is the lute, say they who have never listened to the prattle of their own children."

"The fruit, when green, rears its head like a base man; but when it is ripe in the harvest, it is inclined like the head of the wise."

"Love your enemies—those of kind disposition return love for hatred, as the more you squeeze sugar-cane the more juice it gives."

Says one Hindoo: "Wash charcoal as much as you like, it will always remain black; so a bad man cannot become good." "But," replies another, "let fire enter in the charcoal, and it becomes luminous; and so truth, entering into a bad man, will make him luminously good."

"Do good to others—it will come back to you. The water which you pour on the roots of the cocoa-nut tree comes back to you sweetened from the top."

Yet Hindoo literature abounds in folly and filth, and much of it is unfit for perusal. It is, however, springing up afresh, with the beautiful truths of the Bible infused into it. Their language is very melodious; some of the poetry rhymes at both ends of the lines.

MACHINE DEPARTMENT AT THE AMERICAN INSTITUTE.—During the fair of the American Institute we made arrangements for illustrating the Machine Department of the exhibition, with the intention of publishing it before the fair closed. The engraving was accordingly prepared; but when submitted by the artist who had charge of getting it up, it was rejected on account of the inartistic manner in which it was executed; and we have been obliged to have the machines all re-drawn and re-engraved. The work is progressing, and when done will be a creditable production, as one of the best artists in the city is engaged upon it, and we have the promise of it in season for our next number; but should it not then be ready, we trust to be able to publish it without fail in the following one

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LIGHTNING CONDUCTORS AND ATTRACTORS.

We published an article on this subject on page 305 of the present volume of the SCIENTIFIC AMERICAN, and now recur to it again for the reason it has excited considerable attention. We stated that a lightning-rod was simply a conductor, not an attractor; this is the statement which has caused some commotion, and in regard to which we will make some further comments, in order to spread reliable information before our readers on this important topic. A correspondent writing to us comes to the central idea at once, and says: "Does the point of a rod have no attractive power? If so, why have a point on a rod? A round ball would do better, as it has more conducting surface."

If the efficiency of a lightning-rod depended upon its attractive power, and if this power were centered in its point, then a cheap pointed wooden rod would answer as good a purpose as one of metal. There can be no retreat from this conclusion, as the form (point) and not the material is held to be the attractive agent which invites the electric fluid, and draws it safely down to the earth. The phenomena of attraction and repulsion belong to electrified bodies, but this is a very subtile and intricate branch of electric science connected with *induction*. No lightning-rod, however, is ever erected upon any other consideration than that of a conductor, and its efficiency depends entirely upon its conducting capacity. A steel magnet possesses attractive and repulsive power, but copper does not, and yet the latter metal is much superior for a lightning-rod. A copper rod one-fourth of an inch in diameter is as effective as a steel rod one inch in diameter. A lightning-rod composed of iron or copper, having a ball on it, will conduct lightning from a thunder cloud to the earth, but a pointed rod made of wood or any other non-conducting substance will not answer the purpose at all. Every person knows this; why, then, should there be a single question raised regarding the office of a lightning-rod being simply that of a conductor?

An immense amount of quasi-science has been published by some of our daily papers on this subject, but there is not a person in the world whose scientific opinion on electrical subjects is worth a straw that regards a lightning-rod in any other light than as a conductor. The term is so used by Sir Snow Harris, the most recent writer on the subject. He says: "A prejudice once arose against their use (lightning-rods) under the idea that they did more harm than good, by inviting (another term for attraction) the destruction they were intended to prevent. An attentive examination, however, of numerous cases of damage from lightning has shown that the path of discharge from the cloud to the earth has always been in the line of the least resistance. This line is in all cases the shortest electrical distance; the lightning picks out the *best conductors* in its transit to the earth. The conductor ought to be of metal, and as metals greatly vary in power (lead 1, tin 2, iron 2.4, zinc 4, and copper 12), one of the best should be selected, and copper has many advantages over every other metal. It is found that a copper rod three-quarters of an inch in diameter, or an equal quantity of copper in any other form is capable of resisting the heating effect of any charge of electricity whose effects have been recorded."

Such authority is worthy of attention, yet, as we are not in the habit of pinning our faith to great men's names without some practical data to back it up, we will adduce one or two facts on the subject. Franklin, in one of his letters published in the "Philosophical Transactions" (London), Vol. 64, states that Professor Winthrop saw a tree struck by lightning at a distance of only 52 feet from a pointed conductor attached to a house. The tree was shivered while the house and rod escaped. That is, the lightning fell upon an object which is generally held to have no attraction for it, in preference to one which some say attracts it Franklin also states that, in endeavoring to draw off electricity from a charged sphere, by means of a pointed wire, he found that the point when placed on a glass rod or a piece of wax (non-conductors) had no action whatever to draw it. Had it been an *attractor*, it certainly would have drawn off the electric fluid.

In the report of the "Commission on Shipwreck by Electricity," appointed by the British government, Capt. Wellesley, of the frigate *Sapphire*, which was furnished with copper conductors, says:—"The *Sapphire* often met with severe lightning, but it was never attracted to her." We could furnish several other statements of a similar character, but these are sufficient for the present. If lightning-rods were attractors, instead of being simple conductors, then they would be most dangerous devices, as they would invite the electricity to the destruction of life and property, instead of furnishing safeguards for them.

INFRINGEMENT CASE.

UNITED STATES CIRCUIT COURT, BOSTON.

Before Judge Sprague as referee.

NOV. 19—*Milton D. Whipple vs. The Middlesex Company at Lowell.*—A patent case of considerable importance to wool manufacturers has just been tried and decided before his Honor, Judge Sprague, of the United States Circuit Court at Boston. An action was brought by Milton D. Whipple, of Charlestown, Mass., against The Middlesex Company at Lowell, Mass., for alleged infringements by them of plaintiff's patent for a machine for burring wool. The defendants use what are called the Parkhurst or Goddard steel ring or steel-toothed ring burring cylinders, in connection with their carding-engines. The case was contested with great ability and vigor, with a strong array of counsel and witnesses. A. B. Ely, Esq., of Boston, appeared for the plaintiff, assisted by the Hon. B. R. Curtis and J. Giles, Esq., also of Boston. Hon. B. F. Butler appeared for the Middlesex Company; in addition Mr. Goddard was represented by C. L. Woodbury, Esq., of Boston; and Mr. Parkhurst and the Atlas Manufacturing Company were represented by J. G. King and George T. Curtis, Esqrs., of Boston, and George Gifford, Esq., of New York. A case involving the same issues having been once tried by a jury in Boston, and a verdict had for the plaintiff, and another case having been tried in Connecticut, before Judge Ingersoll, and judgment also had for the plaintiff, it was agreed that this case should be submitted to Judge Sprague as a referee, and it was accordingly so submitted and tried. After a thorough and careful investigation, a decision has been finally given, sustaining the patent and the fact of infringement; and damages have been awarded for $2,000 and costs, which may amount to $1,000 more.

LOOK OUT FOR THE LOCOMOTIVE!

We are much obliged to the *Locomotive*, a sprightly paper published at Indianapolis, Ind., for the following friendly notice. Our go-ahead cotemporary is the official paper appointed to publish the weekly list of letters; it having the largest circulation within the general delivery of the Indianapolis post-office:—

"We would call attention to the prospectus of the SCIENTIFIC AMERICAN, in another column. This paper is known to all practical men, and there are few who can afford to do without it. The reliable and valuable information it contains in a year will profit any man *fifty times* more than any investment of the same amount we know of. It is one of our especial favorites, and will be of all that take it and read it regularly."

LEISURE.—How happy all ought to be who have leisure, a freedom from business or hurry, a convenience of time to do just what the mind dictates—to read, to walk, to ride, to study, or to pray. We hope you, who have leisure, have a consideration for those who have it not. Many a weary limb will rest to-night, but to labor again on the morrow, on and on, day after day, from sunrise till far into the coming night. To such, leisure is unknown. They may be likened unto the apostles, "coming and going, and they had no leisure so much as to eat." You who have leisure, be proud of it, make use of it; once past, it is sunk into the catacomb of eternity. Leisure is spare time, and properly employed, it is so much of life increased beyond its natural span.

"Make time in time, while time doth last;
For time is no time, when time's past."

EXTENSION OF STREET RAILROADS.—Street railroads are rapidly being built in every city in the Union. They are already in operation in Pittsburg, Cincinnati, Chicago, St. Louis, Baltimore, New York, Brooklyn, and Boston, and are now beginning to appear among the other chief cities, such as Milwaukie, Detroit, &c. In Cleveland, Ohio, the building of a line has been commenced. One portion of the plan of this work contemplates a curve in the side of a hill. The whole length of the route is four and one-fifth miles, and it is to be built and run under the management of Mr. H. S. Stevens, the present proprietor of the omnibus line traversing the same route.

A COLUMN OF INTERESTING VARIETIES.

At a recent meeting of the American Institute, it was verbally stated by the Fair Committee, that the receipts of the late annual fair amounted to $13,000, that there had been $13,560 expended, and that there remained bills still due amounting to $2,500, a deficiency which was caused by the expenses of the agricultural fair and the steam plow. The treasurer was ordered to appropriate sufficient money from the treasury of the institute to cover the deficiency occasioned.....An English architect (Mr. Tite) says: "So far as I have observed, all artificial systems of ventilation are a failure. Whether you have to ventilate a large room or a House of Parliament, the best way is to open a window."..... The city of New York is in the same latitude as Naples, in the south of Italy.....The cupola on the New York City Hall, which was burned at the time of the great cable celebration, is just being rebuilt.....M. Thiers, in 1834, while in the French ministry, gave as his opinion, after returning from England, where he had seen the Liverpool and Manchester Railway, that "railways were only toys for the curious, or means of transport in exceptional cases, only".....Professor Whitney, of Yale Collage, is engaged in the translation and publication of a Hindoo work on astronomy.....There were 366 locomotives employed in the working of 1,573 miles of railroad in Canada on the first of January last. Of this number of engines, 209 had been built in the United States, 110 in England, and 47 in Canada.....In Messrs. Cail's locomotive factory, at Paris, in which are about 1,200 workmen, 82 draughtsmen are constantly employed.....There are carp in the lakes of Fontainbleau, which, from certain marks, are believed to be 300 years of age..... Church bells are occasionally made of glass, and one 14 inches high and 13 inches in diameter has recently been placed in the turret of a chapel at Borrowdale, England. .....Most of the German and Prussian railroads, which have been found to be the safest in the world, have single lines only.....A salt company is boring an artesian well at Grand Rapids, Mich. The *Eagle* says the deeper they go the stronger is the brine they get. They have reached a depth of 250 feet, and the water that boiled up tasted quite as briny as that of the ocean, and looked, when running into and mingling with fresh water, like milk.....The tunnel on the Covington and Ohio Railroad, in Virginia, is 4,700 feet long, and 700 feet below the surface of the earth. It is 300 feet longer than the Blue Ridge tunnel. The width is 27 feet, to accommodate a double track, and the hight is 23 feet. .....Mr. Mudie, of London, is the proprietor of the largest circulating library extant owned by one person. Since January, 1858, 200,000 volumes have been added to his collection. The list of these works indicate, to some extent, the relative circulation of different classes of literature in England. The books are thus classed: history and biography, 56,472 volumes; travel and adventure, 25,552; fiction, 87,780; miscellaneous, including works of science and religion and the principal reviews, 45,250. Total, 215,054. The present rate of increase of Mr. Mudie's library exceeds 120,000 volumes per annum, consisting chiefly of works of permanent interest and value.....The sale of Rufus Choate's library, just completed by auction, will realize to his family about $15,000.....The British Museum has just received a magnificent addition to its numismatic treasures, by the gift, from the Count de Salis, of his well-known collection of coins. These are in 14 cabinets, containing, altogether, as many as 7,000 coins, brought together with the greatest taste during many years of the count's life, and at an expense of about £5,000.....Mr. Alfred Robinson, of Hartford, has in his possession a Hebrew shekel which is supposed to be more than 3,000 years old. They are said to be valued at $100 each.....Careful analyses and experiments, made by officers of the United States government and by those of the State of New York, have shown that the salt made at Onandaga, in this State, is the purest and best of any in the world..... There is in Bourbon, Ky., a family, consisting of a man, his wife, and eight children, whose average hight is 6 feet 4½ inches, and average weight 214 lbs. One of the sons is the tallest in the family, and measures 6 feet 11 inches; he also weighs almost 296 lbs. A daughter who died was 6 feet 3 inches in hight, and weighed 160 pounds.....Astronomy was first studied by the Moors, and by them introduced into Europe in 1201.

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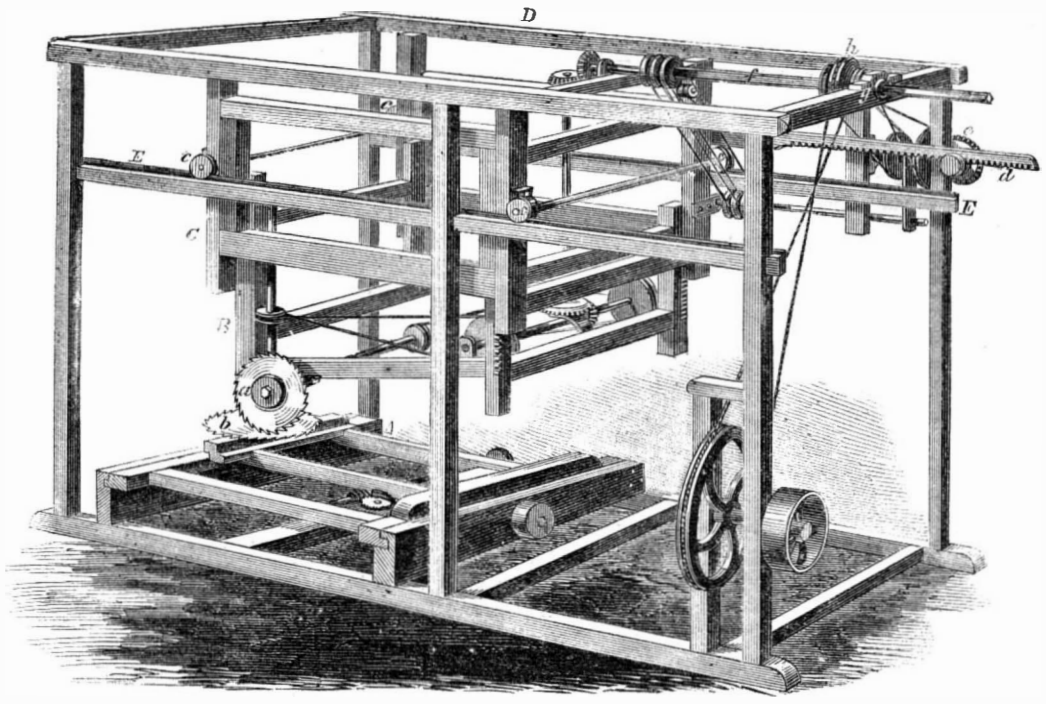
FULGHUM'S SAWING MACHINE.

For sawing square timber, machines have been made in which two circular saws were adjusted with their planes at right angles so as to saw out a stick at one passage of the log; and the invention which we here illustrate consists of a series of contrivances for the more convenient changing of the saws and handling and placing the log in this class of machines.

The two circular saws, *a* and *b*, are placed at right angles upon the ends of shafts which run in journals fastened to the frame, B. This frame, by means of four racks at its corners connected with pinions and a crank, may be moved up and down at the will of the operator, in the frame, C. The frame, C, is supported by friction rollers which roll along the ways, E E, on the frame, D, carrying along the frames, C and B, and feeding the saws as they cut their way through the log. This longitudinal motion of the frames, C and B, is effected by a pinion, *e*, which is geared into the rack, *d*; the shaft, *f*, which transmits the motion to the gears that drive the saws, sliding through its journal, *g*, and being rotated by its pulley, *h*, by means of a bead on the side of the shaft which fits in a slot in the bore of the pulley. The log being placed on the frame, A, and power applied, the saws receive a rapid rotation and are carried along through the log, cutting out a rectangular stick. The frame, A, on which the log rests, is then slid along its ways, by turning a pinion which gears into a rack on the lower side of the frame, thus moving the log horizontally, when another stick is cut in like manner. The ways on which the log frame rests are inclined slightly downward, so that when the log is moved horizontally after a cut, the horizontal saw plate is prevented from rubbing against that portion of the log from which the last preceeding stick had been taken. This is a prime feature in this invention. After one series of sticks have been cut from the log horizontally across it, the frame, B, is lowered sufficiently, and another series is cut, and so on. The several motions mentioned are produced by ordinary mechanical devices, and need no more minute description to be understood by machinists.

The patent for this invention was obtained through the Scientific American Patent Agency, on Aug. 16, 1859, and further information desired in relation to it may be obtained by addressing the inventor, Benjamin Fulghum, at Richmond, Ind.

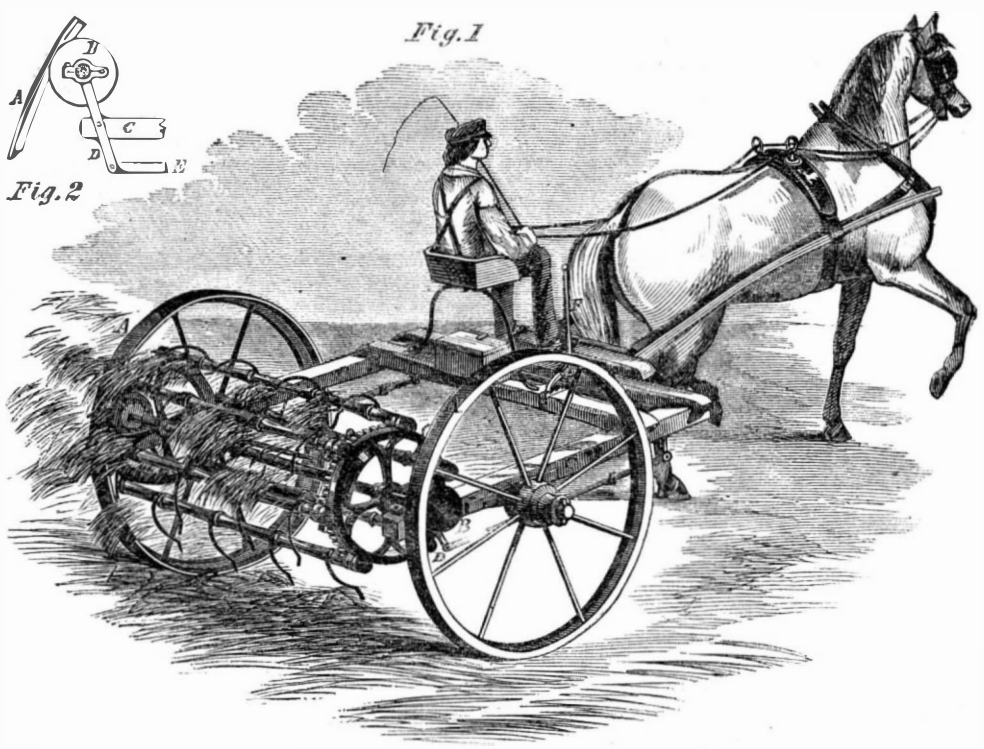


FULGHUM'S IMPROVED SAWING-MACHINE.

IMPROVED HAY-MAKING MACHINE.

The engravings annexed illustrate a machine for spreading and turning hay, which is claimed to obviate the difficulties which have heretofore been encountered in such machines; especially the clogging of the gears.

A simple frame is hung on two wheels, the axles being short and attached to pivoted blocks, so that the wheel may be turned laterally out of the way when it is desired to substitute a rake for the reel. Upon the back end of the frame is suspended a reel to which a rapid rotary motion is given by means of a friction roller, in the manner represented in Fig. 2. A is a section of the periphery of the driving wheel, the tire of which is made considerably wider than the feloe, so as to project inward. Against this projecting portion a roller, B, presses, said roller being firmly keyed to the end of the axle of the reel. The roller is supported on the end of the short lever, D, which is attached to the side of the frame, C, by a pivot, and rests at an angle so that the weight of the reel may press the roll, B, against the inside of the projecting tire. To the lower end of the ever, D, is attached the rod, E, which leads forward, connecting with a rocking bar which crosses the frame under the seat. A rod connected with a similar arrangement from the other wheel is connected with the opposite end of the rocking-bar which is actuated by the lever, F, in a way to lift the reel from contact with the projecting tire of the wheel, A, or to drop it into contact with said tire at the will of the operator. This arrangement also causes the reel to rise from the tire in case the teeth come in contact with a stump, stone or any other rigid object, and thus stop the rotations of the reel and prevent the breaking of the machine.



STODDARD'S HAY-MAKING MACHINE.

The horse is attached to the machine by means of a staple which slides vertically in an uprig slot, and is moved up and down by a screw at the will of the operator, thus enabling him to change the line of draught at pleasure and tip the cart for the purpose of passing over any rigid obstruction, and also to adapt the elevation of the teeth to the quantity of grass upon the ground.

This machine is the invention of J. C. Stoddard, of Worcester, Mass., who has secured it by patents on several different points.

FRENCH GUNBOATS.

The Paris correspondent ("Malakoff") of the *New York Times* gives the following interesting description of one of the new French gunboats, of which a great number are now being constructed:—

"The system of gunboats is acquiring a large development in the French navy, Recently one of these constructions, by way of experiment, was taken from the Mediterranean to the Atlantic; that is to say, from Marseilles by Toulouse to Bordeaux, nearly all the way by water, thus avoiding the passage by the Straits of Gibraltar. France has long nursed the idea of making herself independent of Gibraltar, by cutting a ship canal over the route just indicated: the successful experiment of transporting a small armed vessel from sea to sea, has revived that idea, and will perhaps engage the nation in the undertaking. This species of gunboat has but one mast, and it is driven by a screw propeller. It carries but one gun, but it is of great calibre, and is placed near the bow behind an immense fire-proof screen, which protects the gunners. It consists of a thick wall of oak, covered with 5-inch plate iron, and pierced with an opening for the muzzle. This screen hides all the after part of the vessel and protects the entire deck. When moving forward such a vessel is very hard to hit because the screen is an immense convex shield, incapable of being penetrated by ordinary shot. These boats draw but little water, and thus, being able to penetrate everywhere, may become most useful and terrible instruments of destruction, if properly managed. We must not forget, however, that two of the British gunboats, of similar character, were lately sunk the conflict with the Chinese."

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VOL. I., No. 23.....[NEW SERIES.].....*Fifteenth Year.*

NEW YORK, SATURDAY, DECEMBER 3, 1859.

HYDRAULIC GOLD-MINING.

MOUNTAIN streams have worn deep furrows in the granite rocks, and rivers have cut broad channels through hill and dale; but until recently, the power of water had never thus been used by man in engineering. One of the greatest developments of our times, in what is called "placer-mining," is the employment of the force of water for excavating. This enterprise had its origin, and has reached its highest attainment, in California, where hills have been leveled with the plains, in search of the golden nuggets. In that great State the first mining operations were conducted in the old way, by digging with mattock and spade, and carrying the earth or auriferous deposits in barrows to streams of water to be washed, so as to remove the clay and loam and secure the golden sands. This system was totally inapplicable to what are called the "dry diggings"—those auriferous deposits far removed from supplies of water, especially in the dry season. Our miners soon saw the defects of the old system and invented a new method, not only for economizing their labor, but also of carrying on mining operations, by obtaining a plentiful supply of water, in situations far removed from natural running streams. This plan consisted in bringing the water from a distance by artificial narrow canals or "flumes," and conducting it from a high elevation so as to use its great pressure for washing and excavating. The whole art of placer-mining in Calfornia has been revolutionized by this hydraulic process. Many square miles, in different parts of the country, have thus been made to yield up their gold, which otherwise would have remained forever untouched. It is this system which still enables the miners to pour in a large and steady stream of gold to our mint; otherwise we would now be receiving only driblets.

In Tuolumne county, Cal., there is a canal which is about 64 miles long, and capable of supplying 700 sluice streams for separate parties washing gold. It is carried over deep gulleys, it winds among rocky terraces, and it cost no less than $1,400,000. In an interesting article on the subject, by Mr. Wm. P. Blake, in the last number of the *Mining Magazine*, it is stated that there were 5,726 miles of such water courses in operation in California last year, and that the total cost of them amounted to about $13,575,000. It is also stated that most of these canals were constructed with borrowed capital; but that they have yielded large profits to those who had invested. On the other hand, some of the California papers state that many of these canals have proved a dead loss to those who furnished the funds to build them. Be this as it may, one thing is certain, that they have enriched the country in general by economizing labor and providing means of gold-washing in places where otherwise this was impossible.

For the purpose of operating in a sluice, the water is conducted from an elevated reservoir of from 60 to 100 feet in hight, and it is then ejected under the tremendous pressure (as from a fire-engine) of about 40 lbs. on each circular inch, through strong hempen hose, against the face of a bank which is rapidly undermined, and the loose earth is then washed away leaving the heavy particles of gold behind. By this mode a hundred tuns of earth and gravel can be removed, and all the gold it contains liberated and secured much quicker and with less labor than ten tuns of earth by the old method. Acre after acre of hills are now swept into the hollows without the aid of a single pick or shovel. Water, conducted from a hight of 100 feet, rushes out from a nozzle at the velocity of 80 feet per second, and at a pressure of 40 lbs. on each circular inch. Such a power is certainly a genuine "water ram," when directed against the face of a gold-hill for excavating it.

Gold-mining is only profitable when it yields higher wages than can be earned at other pursuits. By wheeling earth to great distances, to be washed for its gold, the "dry diggings" could not be worked with profit; but now, by this hydraulic system, no bounds can be set to the extent and continuance of gold-mining. A few years ago it was stated that placer-mining was "about run out," and that the returns from California would soon cease altogether. If the old system had continued, this would have been the case before the present day; but now we may reasonably expect large golden supplies for quite a number of years to come. This new engineering offspring of American genius has been extended to distant Australia, and has also been applied recently in North Carolina and in Georgia at the placers along the Chestatee river. In this manner the genius and enterprise of our people have met and subdued great natural difficulties; and the streams of the mountains have been made their willing servants, both to dig and wash, for the purpose of contributing supplies to our currency and furnishing the media of exchange between all nations.

REPUBLICANISM AND THE FINE ARTS.

No reader of history can fail to perceive the constant relation of democratic institutions and the growth of all forms of ideal art. Among the commonwealths of ancient Greece, the most democratic of all was Athens, and it was in Athens that sculpture and architecture were carried to the highest degree of perfection. With the overthrow of freedom in Greece by the invincible power of Alexander, her arts perished; and under the dominion of a barbarian soldiery no similar growth of intellectual power took place on the earth for more than 1,500 years. At length, on the breaking up of the Roman empire, the republics of northern and central Italy made their appearance; and their story is the story of Greece re-told. We see again the same growth of manufactures, commerce, science, literature and art. Among these republics, Florence was the most democratic of all, and the Florentine school of painters is universally recognized as pre-eminent above all other painters of the world. Says Webster: "I know of no way of judging of the future, but by the past." And, judging by the past, we may predict with perfect confidence a great and rapid progress in the cultivation of the fine arts in this country. We have already far outstripped the republics of Greece and Italy in agriculture, manufactures and commerce, in all industrial arts which are of first necessity, and we are just beginning to be in a position in which our accumulated wealth enables us to support those which adorn and refine social life. We are following in the footsteps of our kindred across the Atlantic. England, though in name a monarchy, has really more democratic institutions and more equal laws than either Athens or Florence had, and her land is swarming with painters, and the whole country is being rapidly adorned with the statues of her eminent men. In painting and in lithograph and line engraving, we are probably behind older nations, though we are after them in seven-league boots; and in one kind of engraving, that upon wood, we believe our artists will bear a comparison with those of England, France or Germany. But it is in sculpture that American artists have achieved the greatest triumphs. We have heard a gentleman of exquisite and cultivated taste, who had spent years in the galleries of Europe, and who is an enthusiastic admirer of statuary, express the opinion that Powers' Greek Slave is the finest statue in the world. And in our opinion, no more faultless conception of female beauty was ever chiseled from marble than Palmer's White Captive, now on exhibition in this city.

From the lights of past history and the general principles of human nature, we have been long anticipating a great growth of the cultivation of the fine arts in this country, and several facts seem to indicate that it is just now bursting forth with a rapidity and to an extent characteristic of the age and especially of the land in which we live. We observe in the daily papers no less than eight exhibitions of paintings and statuary advertised in this city, at this time. We are informed that Church's "Heart of the Andes" has just been bought by a New York gentleman, for $10,000. This fact is particularly gratifying, for our artists are too much in the habit of dashing off unsightly daubs instead of bestowing that study and labor, both in preparation and execution, which is absolutely necessary to excel, and then, when their abortions fail of demand in the market, of raising whining complaints that art is not patronized. If any American artist who has the peculiar gift of genius, which is the first requisite in a painter, will put forth the exertion necessary to produce anything of value, and will finish his pictures with the elaborate care characteristic of Church, we believe he will obtain a price that will reward him liberally for his time. And we trust that many of our wealthy men will imitate the example of Corcoran, Fish, Belmont and many others who liberally patronize American art, and thus stimulate our artists to higher successes with the pencil, brush and chisel.

METEORS.

Meteors are masses of metal, mostly iron, varying in size from half a mile in diameter to a small pebble, which are seen rushing along in the vicinity of the earth at an immense velocity, and which on entering the atmosphere become intensely hot, sometimes throwing off scales of hot metal, and occasionally bursting with a report the loudest ever heard by man. Some fifty years ago, one burst in the neighborhood of New Haven, and some of the pieces were dug out from the ground into which they penetrated deeply from their great velocity, and were obtained before they were cold. Professor Silliman visited the place as soon as he could, and procured quite a number of the pieces. All meteoric stones yet found have essentially the same appearance and composition. They are covered with a black crust or enamel on the outside, as if they had been exposed to an external heat which had fused the surface, while the interior is a grey metallic mass. They are composed of about 57 per cent iron, 26 nickle, 14 phosphorus, with small quantities of cobalt, copper, silica, alumina, zinc, and chlorine. Though the fall of stones from the skies has been loosely observed and recorded through the whole course of history, it is only within a century that this most startling phenomenon has been subjected to the careful observation characteristic of modern science; and even now there is great room for improvement in the mode of observing these heavenly visitors. On Tuesday, April 26, 1802, at about one o'clock in the afternoon, a meteor burst in the neighborhood of Alencon in France; and a perfect shower of stones fell to the ground, the largest weighing 17½ pounds and the smallest a few grains. The space ever which they fell was seven or eight miles in length by two or three in breadth, and the number of stones was not less than 2,000. In 1804, on the 5th of April, another of these phenomena was noticed near Glasgow in Scotland. The report sounded like three or four cannon fired in succession; then followed a whizzing noise, and then a sound as of a heavy body striking the earth. One of the fragments fell into a ditch very near the place where some men were at work, and the overseer immediately dug it out. On the 13th of March, 1807, the inhabitants of Juchnow, in Russia, were alarmed by an uncommon loud clap of thunder, and two peasants saw a stone fall to ground, which it penetrated to a considerable depth beneath the snow. On digging it out it was found to weigh 10 pounds. The fall near New Haven already mentioned, occurred in 1807, at six o'clock in the morning on the 14th of December. In all parts of the earth stones have been found of the very peculiar composition characteristic of meteors, and with several of them is connected a tradition that they fell from heaven. The noise produced by the explosion is the loudest of any with which we are acquainted. The sound produced by the explosion of the meteor of 1719, at an elevation of at least 69 miles, was heard as the report of a very great cannon or broadside, shook the windows and doors of houses, and threw a looking-glass out of its frame, which was broken. The report of a meteor in 1756 threw down

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several chimneys at Aix in France, and was taken for an earthquake.

There are several theories in regard to meteors, but the most plausible one is that they are small planets revolving around the sun in very elliptical orbits, and that occasionally they come so near the earth as to be drawn within the limits of the atmosphere, when they are heated by the joint action of the condensation of the atmosphere and the checking of their velocity; that this heating causes them to throw off scales from the surface which fall to the ground, while the principal body keeps on in its swift flight. Sometimes the heat becomes so great through the whole mass as to cause it to fly to pieces; one writer supposes, even into fine dust. We hope, by the time of our next issue, to collect sufficient facts in regard to the meteor which recently passed over this city, to enable us to give a pretty full account of it. It was one of the most remarkable which has ever been seen.

GLASS-DRILLING.

MESSRS. EDITORS:—In your last issue I noticed an article entitled "To Bore a Hole through Glass;" and as a variety of opinions are supposed to be better than a single one (if based upon experience), I venture the liberty to express mine. A short time since, I had occasion to bore some holes through a piece of French crown glass, one-quarter of an inch in thickness. The glazier who cut it for me assured me that *nothing* but a round bar of lead used with emery and water would bore the desired holes. And (by the way) I think lead is preferable to iron, as emery adheres to it much better. But not fancying his slow but sure process, I determined to perform the work more expeditiously. Accordingly I procured a small Stubbs' file, and grinding the point to what I thought the proper shape, bored four holes, one-quarter of an inch in diameter, in the short space of half an hour. By trying the same thing since, I am confident that a triangular file of Stubbs' manufacture will never fail, if used with water or turpentine, either of which I consider equally good. H. W.

Jackson, Mich., Nov. 21, 1859.

RABBITS AND TREES.

A simple and perfectly efficacious recipe for preventing rabbits and hares from barking trees, is to take as much thoroughly skimmed milk as required, and mix it up with soot, till about as thick as paint. With this, paint over the tree with a whitewash brush. It is done very quickly, at little expense and trouble. It lasts well one season.—*Agricultural Gazette.*

[As the season is at hand when trees should be treated to protect them from being girdled by rabbits and mice in winter, the above may be very useful to farmers who live in districts where they can obtain coal soot, but lampblack will answer the same purpose, to those who cannot get the former. We have been assured by those who have tried the experiment, that coal tar is excellent to prevent such animals injuring fruit and other trees. It can be applied warm, with a brush, and now is the time to put it on, before the snow falls. It should be applied close to the root and upwards, to the hight of two feet, at least.—EDS.

DEFECTIVE IRON STEAMERS.—The *Royal Charter*, which was recently wrecked on the coast of England, as noticed by us last week, was an iron vessel, and seems to have been constructed of very poor metal and in the most defective manner. She parted amidships so suddenly and broke to pieces so completely and rapidly after she struck, that we are confident no American wooden ship would have done so under the same circumstances. Every ship should be constructed like a bridge—capable of sustaining all the strain placed upon it, even if it were suspended by the extremities. The iron screw steamer *Indian*, belonging to the Liverpool and Canadian Steamship Company, was wrecked on the 21st ult. on the coast of Nova Scotia. She was driven on shore in a gale and broke across in the middle like the *Royal Charter*.

ALUMINA AND MERCURY.—The properties of an amalgam of aluminum are very remarkable. Under the influence of mercury it ceases to be a precious metal, and acquires the properties of an alkaline earthy metal. When exposed to the air the amalgam instantly loses its lustre, becomes heated and oxydizes rapidly, and is converted into alumina and metallic mercury. Water decomposes it with evolution of hydrogen, formation of alumina and deposition of mercury. Nitric acid attacks it with violence.—*Comptes Rendus.*

ADULTERATED OIL OF PEPPERMINT.

The following useful information has been communicated by Dr. C. Bullock to the *American Journal of Pharmacy*, regarding adulterated oil of peppermint:—

"An article of oil of peppermint has been sold in the Philadelphia market within the past fortnight. It is of a light yellow color, but considerably darker than is usual with freshly distilled oil of mint, and presents the following characterisicts: When evaporated from a piece of white unsized paper it leaves a yellow mark. Dropped into alcohol of 95 per cent, it does not disseminate itself, but falls to the bottom of the glass in broken globules, and collects in a distinct stratum.

"Agitation produces dissolution, but the solution is turbid, with an amount of oil which should dissolve freely. It presents no re-action with chromic acid, but when dropped on a crystal of iodine, the iodine intumesces and fumes. No such reaction is produced by a pure oil of peppermint. The density of the oil is 0.870. A recent sample of Borton's oil gave a density of 0.90. These characteristics would point to turpentine as the probable adulteration. It has been suggested by a practiced distiller of oil of peppermint that the adulteration was the essential oil of fireweed. This supposition was based on the peculiar strong smell left after most of the oil was volatilized from paper.

"Recent oil of peppermint should volatilize completely from the paper without leaving a mark; when dropped into alcohol of 85 per cent, it should dissolve completely without agitation."

WEEKLY SUMMARY OF INVENTIONS.

The following inventions are among the most useful improvements patented this week. For the claims to these inventions the reader is referred to the official list on another page:—

IMPROVEMENT IN FLOATING BATTERIES.

This invention consists in the construction of a floating battery of circular form, with a central upright shaft, by which it is capable of being anchored in a tide-way, and around which it can be made to revolve while at anchor, to bring all its circular series of guns, in succession, to bear on any object. It also consists in a certain arrangement of screw-propellers in the circular battery, whereby provision is made for giving it a rotary motion about its central shaft when at anchor, or for propelling and steering it from place to place. Epenetus A. Willis, of Cold Spring, L. I., is the inventor.

IMPROVED EVAPORATING APPARATUS.

This invention consists in the employment of superheated steam as the heating agent for the evaporation of brine, cane-juice, sirups or other liquids, by allowing it to circulate through pipes surrounded by the liquid in the evaporating-vessel, or through a jacket or false bottom, with which the said vessel is provided, or in any other similar manner. It further consists in superheating the steam generated from the liquid at one stage of the evaporating process, or in one part of the evaporating-apparatus, by passing it through suitable heaters and enabling it, when so superheated, to heat and evaporate the liquid which is at another stage of the process, or in another part of the apparatus. John P. Hale, of Kanawha, Va., is the inventor of the above improvements.

MACHINE FOR SPLITTING SHOE PEGS.

E. T. Weeks, of Franconia, N. H., is the inventor of a machine for the above purpose, which invention consists in the employment of a reciprocating knife, in connection with a peculiar means employed for clamping the bolt and feeding the same to the knife; also, in the employment of a gage, in connection with the feeding-device, for perfectly adjusting the bolt relatively with the knife.

IMPROVEMENT IN STEAM PLOWS.

Joseph W. Fawkes, of Christiana, Pa., has invented and patented an additional improvement in steam plows, wherein he employs a large barrel-shaped or oilged driving-wheel for the propulsion of the machine. He avoids the sinking in the earth of the wheels hitherto employed, and is thereby enabled to employ the locomotive in the culture of soft land, or where it is desirable to pass the locomotive over plowed land, in seeding, harvesting, &c.

GRAIN-BINDER.

This invention and improvement relates to the binding of grain into sheaves before it leaves the platform of the harvester, by a simple automatic arrangement which requires only one attendant, and which will gather the grain as it falls upon the platform of the harvester, and bundle it, and at the same time secure the band around the bundle. It consists in the arrangement of a traveling segment in a fixed frame, operated by suitable gearing so as to have an alternate circular movement. This segment carries a jointed arm around the grain, which arm has on its end a button which is fastened to one end of the band to be secured around the sheaf. It further consists in a novel arrangement of parts for operating the aforesaid jointed (button) arm with an independent movement, so that its motion will be faster than that of the traveling segment. It also consists in arranging near the end of the elevated frame, a peculiar device, which, in connection with a loop-holder and jointed arm, will retain the loop, on one end of the band, in position for receiving the button, and as the button is passed through said loop it will be properly secured around the bundle; said device being operated by a projection on the end of the traveling segment, for retaining the loop on its holder until it it is relieved at the proper time by the jointed arm. This contrivance is the invention of C. H. Durkee, of Hartford, Wis.

APPARATUS FOR REGULATING THE PRESSURE OF WATER IN PIPES.

The object of this invention is to regulate the pressure of the water in pipes so that the latter will not be subjected to any more pressure than is actually necessary to force the water to the desired hight, thereby guarding against the bursting of the pipes and obviating the employment of those heavier and stronger than is necessary to sustain a pressure due to the requisite hight of the columns of water within them. The invention is more especially designed to be applied in certain cases to water pipes which supply buildings in cities, in which pipes the water is not required to be forced up so high as the static pressure in the service pipe will admit of; for instance, in the city of Brooklyn, which is supplied with water under a considerable head and the pipes in low buildings subjected to unnecessary pressure. It consists in the employment of an air-chamber provided with a plunger or yielding bottom to which a valve stem is attached, the air-chamber and valve being arranged in connection with suitable pipes and in such relation with the supply pipe as to effect the desired end. The credit of this invention is due to James Stratton, of Brooklyn, N. Y.

FOREIGN SUMMARY—NEWS AND MARKETS.

It is gratifying to learn that many new American inventions are appreciated in Europe, and some of them more highly than at home. We find this to be the case with Silver's Marine Governor, illustrated and described on page 356, Vol. XI., SCIENTIFIC AMERICAN. In a paper read before the late meeting of the British Association for the Advancement of Science, by Mr. James Oldham, he stated that several of these governors were now used in steamships belonging to Hull, England, put up by John Hamilton, of Glasgow, and they were giving the highest satisfaction. They are so sensitive in their action that the slightest pitching motion is at once indicated, and the steam admitted or excluded as the case may be. "By the use of this governor," he said, "the full power of the engines is in immediate and constant requisition, producing a saving of fuel, and also the preventing of breakage from racing of the engines."

It is stated in *Cosmos*, that M. Corne and M. Demaux have discovered that plaster-of-Paris containing three per cent of coal tar is a most powerful disinfectant. M. Velpeau, a celebrated surgeon in one of the Paris hospitals, also asserts that he has applied it as a plaster for ulcers, that it is very effective, and that it renders inodorous semi-putrescent masses. It has been recommended by the Academy of Sciences for use in the military hospitals.

Excellent buttons and handsome substitutes for cameos can be made, according to a foreign periodical, of soapstone (steatite). For this purpose it is submitted for several hours to a white heat, after which it is cooled, and is said to become so hard as to resist the action of a file. Of course, the buttons and cameos are cut before they are heated. Such articles may be polished with emery, and colored with chloride of gold, which stains them purple, or nitrate of silver which makes them

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black. Here is a new field for the enterprise of our manufacturing artists.

In a communication to the Edinburgh *Philosophical Magazine*, Mr. H. C. Sorby states that he has made several experiments with water in capillary tubes to determine when it boils, and at what temperature it freezes. It can be raised to about 212° without boiling, and lowered below 32° (the freezing point) without freezing. In tubes of one two-hundredths of an inch, he lowered its temperature to 5° without freezing, when not in contact with ice. It thus appears that by the water adhering to the sides of the tube, it is prevented from becoming solid at a temperature much below that at which it freezes when in a large body.

Mr. Thomas Spencer, the discoverer of the electrotype, has lately made another important discovery. He has ascertained that the magnetic oxyd of iron which abounds in rocky strata, sands, &c., destroys all discoloring and polluting organic solutions in water. Even sewerage water can be thus almost instantaneously purified. Moreover, Mr. Spencer has discovered that the apparently mechanical process of filtration is itself magnetical, and it being known that all substances are constitutionally more or less subject to magnetical influences, all extraneous matter suspended in water may be rapidly separated in filtration either by magnetic oxyd or black sand of iron.

Mr. Bailly, the president of the London Astronomical Society has been for six years weighing the world in different ways, and is now sure that he has obtained its specific gravity so nearly accurate that his figures cannot err more than 0.0058. The total weight of the world in gross tuns is 6,062,165,592,211,410,488,889, according to his scales.

Considerable has been published in several of our papers relating to the English river ferry-boats, at Liverpool and other places. They have no upper cabins nor spacious saloons like the ferry-boats in this city. Much better boats should be used at Liverpool, but they could not have such an amount of upper works as those on our rivers. The awful storms which visit the British coast, with the tremendous roll of the Atlantic rushing up the rivers so near to the sea, would not permit ferry-boats like ours to be run. It is now proposed to construct a huge iron tunnel under the Mersey at Liverpool. The idea is taken from the several illustrations of tunnels which have appeared in former volumes of the SCIENTIFIC AMERICAN, and which had been proposed for communication between New York and Brooklyn under the East river.

English rails are in better demand than they were a few weeks since. The Welsh are selling at £6 per tun for cash, and Staffordshire at £7. Scotch pig iron has fallen a little, the cash price in Glasgow being £2 12s. Banca tin is selling at £139 per tun; Straits, at £136. Copper is in good demand. Spelter has improved, the price being £21.

The New York and Philadelphia Steamship Company have purchased the iron screw steamers *Edinburgh* and *Glasgow*. Their price was £52,500, about half their original cost. Although they have changed proprietors, they will continue to sail regularly between Greenock and New York.

New York Markets.

CANDLES.—Sperm, city, 38c. a 40c. per lb.; sperm, patent, 50c.; wax, paraffine, 50c.; adamantine, city, 18½c. a 21c.; stearic, 27 a 28c.

COAL.—Authracite, $4.50; Liverpool orrel, $10; cannel, $12.

COPPER.—Refined ingots, 22½c. a 23c. per lb.; sheathing, 26c.; Taunton yellow metal, 20c.

CORDAGE.—Manilla, American made, 8¼c. per lb.; Rope, Russia hemp, 12c.

COTTON.—Ordinary, 8½c. a 8¾c.; good ordinary, 9¾c. a 10c.; middling, 11⅜c. a 11⅞c.; good middling, 11⅞c. a 12⅜c.; middling fair, 12⅜c. a 13⅛c.

DOMESTIC GOODS.—Shirtings, bleached, 26 a 32 inch per yard, 6c. a 8c.; shirtings, brown, 30 inch per yard, c. a7¼c.; shirtings, bleached, 30 a 34 inch per yard, 7 a 8¼c.; sheetings, brown, 36 a 37 inch per yard 5½ a 8¼c.; sheetings bleached, 36 inch per yard, 7¼ a 15c.; calicoes, 6c. a 11c.; drillings, bleached, 30 inch per yard 8¼ a 10c.; cloths, all wool, $1.50 a $3.50; cloths, cotton warp, 85c. a $1.37; cassimeres, 85c. a $1.37½; satinets, 30c. a 63c.; flannels, 15c. a 30c.; Canton flannels, brown, 8½c. a 13c.

FLOUR.—State, superfine brands, $4.90 a $4.95; Ohio common brands, $5.05 a $5.20; Ohio, fancy brands, $5.30 a $5.40; Michigan, Indiana, Wisconsin, &c., $5.25 a $5.35; Genesee, extra brands, $5.60 a $7.50; Missouri, $5.10 a $7.50; Canada, $5.15 a $5.20 Richmond City, $6.50 a $7.25; Baltimore (Howard-street), $5.50 a $6.25; rye flour, fine, $3.60 a $3.90; corn meal, $4.05 a $4.10.

HEMP.—American undressed, $140 a $150; dressed, from $160 a $200. Jute, $87 a $90. Italian, $275. Russian clean, $190 per tun. Manilla, 6½c. per lb.

INDIA-RUBBER.—Para, fine, 70c. per lb.; East India, 50c. a 52c.

INDIGO.—Bengal, $1 a $1.55 per lb.; Madras, 75c. a 95c.; Manilla, 60c. a $1.15; Guatemala, $1 a $1.25.

IRON.—Pig, Scotch, per tun, $23.50 a $24; Bar, Swedes, ordinary sizes, $87 $90; Bar, English, common, $42.50 a $43; Sheet, Russia, 1st quality, per lb., 11¼c. a 11⅝c.; Sheet, English, single, double and treble, 3⅛c. a 3⅞c.; Anthracite pig, $24 per tun.

IVORY—Per lb., $1.25 a $1.80.

LATHS.—Eastern, per M., $2.10 a $2.15.

LEAD.—Galena, $5.80 per 100 lbs.; German and English refined, $5.65; bar, sheet and pipe, 5¾c. a 6c. per lb.

LEATHER.—Oak slaughter, light, 31c. a 32c. per lb.; Oak, medium, 31c. a 33c.; Oak, heavy, 30c. a 31c.; Oak, Ohio 29c. a 30c.; Hemlock, heavy, California, 20½c. a 21½c.; Hemlock, buff, 15c. a 18c.; Cordovan, 50c. a 60c.; Morocco, per dozen, $18 to $20.; Patent enameled, 16c. a 17c. per foot, light Sheep, morocco finish, $7.50 a $8.50 per dozen.; Calf-skins, oak, 57c. a 60c.; Hemlock, 56c. a 60c.; Belting, oak, 32c. a 34c.; Hemlock, 28c. a 31c.

LIME.—Rockland, 80c. per bbl.

LUMBER.—Timber, white pine, per M feet, $17.50; yellow pine, $35 a $36; oak, $18 a $28; eastern pine and spruce, $13 a $15 White Pine, clear, $35 a $40; White Pine, select, $25a $30; White Pine, box, $14 a $18; White Pine, flooring, 1¼ inch dressed, tongued and grooved, $24.50 a $25; Yellow Pine, flooring, 1¼ inch, dressed, tongued and grooved, $29 a $32; White Pine, Al bany boards, dressed, tongued and grooved, $20 a $21; Black Walnut, good, $45; Black Walnut, 2d quality, $30; Cherry, good, $45; White Wood, chair plank, $45; White Wood, 1 inch, $23 a $25; Spruce Flooring, 1¼ inch, dressed, tongued and grooved, each, 22c.a 24c.; Spruce Boards, 15c. a17c.; Hemlock Boards, 12½c. a 14c.; Hemlock wall strips, 10c. a 11c.; Shingles, cedar, per M, $23 a $35; Shingles, cypress, $12 a $25; Staves, W. O. pipe, light, $55 a $58; Staves, white oak, pipe, heavy, $75 a $80; Staves, white oak, pipe, culls, $30 a $35; Staves, do. hhd., heavy, $70; Staves, do. bbl. light, $30 a $35; Staves, do. bbl. culls, $20; Mahogany—Duty, 8 per cent. ad. val. —St. Domingo, fine crotches, per foot, 35c. a 45c.; St. Domingo, ordinary do., 20c. a 25c.; Honduras, fine, 12½c. a 15c.; Mexican, 13c. a 15c.

NAILS.—Cut at 3¼c. a 3⅜c. per lb. American clinch sell in lots, as wanted, at 5c. a 5½c.; wrought foreign, 3¾c. a 3½c.; American horseshoe, 14½c.

OILS.—Linseed, city made, 56c. per gallon; linseed, English, 56c.; whale, bleached winter, 59c. a 60c.; whale, bleached Fall, 58c.; sperm, crude, $1.35; sperm, unbleached winter, $1.45; coal oil, $1; lard oil, No. 1 winter, 90c. a 95c.; refined rosin, 30c. a.40c.; camphene 46c. a 47c.; fluid, 53c. a 55c.

PAINTS.—Litharge, American, 7c. per lb.; lead, red, American, 7c.; lead, white, American. pure, in oil, 8c.; lead, white, American, pure, dry, 7¼c.; zinc, white, American, dry, No. 1, 5c.; zinc, white, French, dry, 7¼c.; zinc, white, French, in oil, 9½c.; ochre, ground in oil, 4c. a 6c.; Spanish brown, ground in oil, 4c.; Paris white, American, 75c. a 90c. per 100 lbs.; vermillion, Chinese, $1.12½ a $1.22; Venetian red, N. C., $1.75 a $2.31¼ per cwt.; chalk, cash, $4.75 per tun.

PLASTER-OF-PARIS.—Blue Nova Scotia, $2.75 a $2.87½ per tun; white Nova Scotia, $3; calcined, $1.20 per bbl.

RESIN.—Common, $1.50; per 310 lbs.; strained, No. 2, &c., $1.60 a $2; No. 1, per 280 lbs. $2.25 a $3.50; white, $3.75 a $4.50; pale, $4.50 a $6.

SPELTER plates, 5c. a 5¼c. per lb.

STEEL.—English cast, 14c. a 16c. per lb.; German, 7c. a 10c.; American spring, 5c. a 5¼c.; American blister, 4¼c. a 5½c.

TALLOW.—American prime, 11c. per lb.

TIN.—Banca, 32c.; Straits, 30½c.; plates, $7.25 a $9.25 per box.

TURPENTINE.—Crude, $3.50, per 280 lbs.; spirits, turpentine, 46c per gallon.

WOOL.—American, Saxony fleece, 50c. a 55c. per lb.; American full blood merino, 46c. a 48c.; extra, pulled, 45c. a 50c.; superfine, pulled, 37c. a 41c.; California, fine, unwashed, 24c. a 32c.; California, common, unwashed, 10c. a 18c.; Mexican, unwashed, 11c. a 14c.

ZINC.—Sheets, 7¼c. a 7½c. per lb.

The foregoing rates indicate the state of the New York markets up to November 24th.

There has been very little change in the prices since last week, thus showing a fair and steady business.

The reports from the western cities regarding the sales of grain represent great uniformity in the prices and sales The receipts in this city have been very heavy, and the stock is rapidly augmenting.

The foreign trade of this port for the last week, compared with that of the corresponding season last year, may be epitomized thus:—

Imports, week ending Nov. 19, 1859	$4,008,871
" corresponding week last year	1,998,095
Increase in 1859	$2,110,776
Exports, week ending Nov. 19, 1859	$1,504,820
" corresponding week last year	1,356,135
Increase in 1859	$148,685

Foreign goods are in moderate request, except for the newest and most desirable patterns. Silks continue to be largely placed at auction, and prices almost invariably run low. Robes, with two or three flounces, meet with moderate sale, and are retailed at exceedingly low rates. Other goods are quiet, and slow of sale, both at public and private sale. The salesrooms are crowded with accumulated goods.

A steady fair demand prevails for most descriptions of dry goods of domestic manufacture, and prices have undergone but little change. The manufacturers are generally engaged on fabrics for the spring trade, which promises to be large. The inquiry for export is good, and the sales present a larger aggregate than was generally looked for among the trade. Notwithstanding the present month was generally expected to be very dull, the aggregate transactions have been to a fair extent, and prices have been sustained.

ISSUED FROM THE UNITED STATES PATENT OFFICE

FOR THE WEEK ENDING NOVEMBER 22, 1859.

[Reported Officially for the SCIENTIFIC AMERICAN.]

*** Pamphlets giving full particulars of the mode of applying for patents, size of model required, and much other information useful to inventors, may be had gratis by addressing MUNN & CO., Publishers of the SCIENTIFIC AMERICAN, New York.

26,150.—Charles J. Addy, of Roxbury, Mass., for an Improved Clock Escapement:

I claim the independent gravity pallet, f, pivoted to a fixed bearing, in combination with a recoil pallet swinging with the pendulum, in the manner substantially as set forth.

26,151.—Moses Allan, of Utica, N. Y., for an Improvement in Metal-planing Machines:

I claim, first, The construction of the apparatus F E g, shown in Fig. 2, and its adaptation to the use of the ordinary planing-machine, and its combination therewith and for the purposes described.

Second, The combination of the bearing-stands, H I, and the disk, M, with the carriage of the machine, connected and arranged substantially as described, and for the purposes described; the whole being constructed, combined and operating substantially in the manner set forth.

26,152.—E. G. Allen, of Boston, Mass., for a Combination Steam Gage:

I claim the combination and arrangement of the several instruments requisite to enable the engineer to regulate the proper working of steam machinery, substantially as set forth; the said instruments being inserted in one case, and having the hands or other indicators upon one face or dial plate, in the manner and for the purposes specified.

26,153.—Samuel Barber, of South Brunswick, N. J., for an Improved Washing-machine:

I claim the combination with the lever, N, for operating the frame, D, of a curved extension guide, R, for adjusting the frame in the manner set forth; and—

Second, The arrangement, with the above, of the serrated arc, J, on top of the dash-board, G, for adjusting the inclination of said board, for the purposes and in the manner specified.

[This invention is an improvement in the adjustment of a washing-machine for adapting it to the various articles to be washed, by adjusting the dash-board to or from the surface of the box, at the same time giving, by a peculiar adjustment of a swinging frame, a greater or less sweep to the dash-board. The invention consists, first, in the employment of a segmental extension guide-piece attached to the frame of the dash-board, and operated by a friction roller attached to a hand lever, so that the motion of the frame can be regulated, and the pivot of the lever placed to its least possible working distance from the fulcrum; and it also consists in regulating the dash-board by means of a segmental rack extending from the top and in rear of the dash-board, and a pin passing down through a cross-tie of the swinging frame into the teeth of said rack.]

26,154.—Eli Bartholomew, of Cleveland, Ohio, for an Improvement in Beehives:

I claim the arrangement of the outer casing, A, and the inner casing, B, in relation to each other, and the ventilating openings, H, in cover, G, which cover is furnished with a top, K, and boxes, L L, in the manner and for the purposes specified.

26,155.—Jerred Beach, of Freeport, Pa., for an Improved Saw-set:

I claim the arrangement of the guide, c, with slot, g, levers, f and m, connecting-link, o, set screws, 1 2 3 4 and 5, when used in connection with the gage, a, graduating rest-plate, d, regulating screw, e, anvil, i, and set, j; the whole being arranged and constructed substantially as described for the purpose set forth.

26,156.—D. Berry, of Huntington, Ind., for an Improvement in Automatic Canal Bridges:

I claim the bridge, I, arranged to work on inclined ways, F E, and connected by a chain and wheel, M N, or their equivalents, to a shaft, O, which is connected, by gearing, to segments, Q, in line with the bridge and the boat, so that the former can be actuated by the movement of the latter, substantially as described.

[The object of this invention is to obtain a bridge for canals that may be opened by a boat as it passes along, and closed by its own gravity after the boat has passed. The device is perfectly automatic in its operation throughout, allowing low bridges to be used in cases where high piers and bridges are now required in order to allow the boats to pass underneath them.]

26,157.—Milton B. Bishop, of Whitingham, Vt., for an Improvement in Washing-machines:

I claim the means of operating the two wash-boards, viz.: the arrangement and application of the two sets of levers or brakes, F E, together and with respect to the wash-boards, B C, disposed one over the other and in the tub, as described.

I also claim, in combination with the upper wash-board, B, and its brake, H, the rocker shaft, K, the slide-bar, L, and the springs, M M; the same being for the purpose or objects specified, meaning, also, to claim the combination of the said rocker shaft, the slide and springs.

26,158.—Wendlin Bleser, of New York City, for Composition Cement or Mortar:

I claim the mortar described, made and employed substantially as set forth.

26,156.—Joseph W. Bradley, of New York City, for an Improvement in Ladies' Bustles:

I claim a bustle consisting of a waist-band, composed in parts of strips, a a, of metal or other elastic material, and a spiral spring, A, tapered from the middle towards each end, applied to and combined with such waist-band substantially as described.

[This invention consists in the combination of a waist-band, and a spiral spring tapered from the middle towards each end.]

26,160.—Lockwood B. Brooks, of New York City, for an Improvement in Steam Valves:

I claim rendering the two parts, B and C, of the balanced puppet valve, adjustable, relatively to each other, by connecting the stem, B', to the sleeve, C', by the yoke, D, or its equivalent, arranged and operated substantially in the manner and for the purposes set forth.

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26,161.—George Caward and David C. Caward, of Prattsburgh, N. Y., for an Improvement in Road-scrapers:

We claim the reversible revolving and adjustable blade, B, with the adjusting-boxes, C, when made and operated as and for the purpose specified.

Also, the circular arms, D, with the wheels, E, when made and used as specified and for the purpose set forth.

26,162.—A. J. Chapman, of Bayou Goula, La., for an Improvement in Bagasse Furnaces:

I claim, first, The employment of the central air heating-chamber, n, having discharge passages, n3, leading into the furnace in its sides, and a central descending flue, i, in combination with a double-walled furnace, F, having an air-heating chamber, f, between its walls, and discharge passages, z, through its inner wall, leading into the fire-chamber, substantially as and for the purposes set forth.

Second, The combination of the partitioned and valved air-heating chamber, f V X, between the walls of the furnace, with the upper and lower hot-air passages, a b, and mixing-chamber, c, substantially as and for the purposes set forth.

Third, The combination of the auxiliary valved-flue, Y r', leading directly to the chimney, with the valve, d, boiler-flue, B' r, and the furnace, F, substantially as and for the purposes set forth.

Fourth, The combination of the valve, O', in the hopper, with the cylinder feeder, S, carrier-drum, h3, cam, t', and lever, O, substantially as and for the purposes set forth.

26,163.—Matthias P. Coons, of Brooklyn, N. Y., for an Improvement in Apparatus for Generating Illuminating Gas:

I claim, first, The particular form and manner of constructing and combining a gas-generating retort, consisting of a fusion-chamber and barrel, as represented in Fig. 1, A, Nos. 1 and 3, as combined for the purpose specified.

Second, I also claim the diaphragm, J, in combination with the chamber, F and D, and diaphragm, N, as represented in Fig. 4, in the manner and for the purpose specified.

Third, I also claim the chamber, H (Fig. 7), constructed as and in combination with the other apparatus specified.

Fourth, I also claim the chamber, K (Fig. 9), as attached to the cover, M, in connection with the escape-pipe, L, with a stop-cock, or its equivalent, attached in the manner and for the purpose specified.

Fifth, I also claim, in combination with the apparatus specified, the projecting ridge on facing-rim or flange, O, and the corresponding groove, P, in the door, N; and I also claim, in combination, the yoke or bar, R, and crank screw, S, as combined: and also the hook-hinges, X (all of which are represented by Fig. 10), as set forth and specified.

26,164—Benjamin P. Crundall, of New York City, for an Improvement in Children's Sleds:

I claim connecting the head and neck, A, of the horse to the bottom or in front thereof of a child's sled, having spring or other runners, in such a manner that the pole may be secured under the bottom, B, of the sled, substantially as shown in the drawings at Fig. 1, and for the purpose set forth.

26,165.—Edward Crane, of Dorchester, Mass., for an Improvement in Locomotive Engines:

I claim the combination, in a locomotive, of a boiler and engine, with a water tank, coal box, blower and baggage department, on one long truck frame suspended underneath the axles of the wheels, arranged substantially as described.

26,166.—Edward Crane, of Dorchester, Mass., for an Improvement in Railroad Cars:

I claim the use of a single long truck for the support of a railroad car, when the frame of said truck is constructed and suspended substantially as described.

I also claim the use of cylindrical bars of iron, passing under the frame of the truck, and nearly in contact with the rails, for the purpose of keeping the truck frame from striking the rails or ground in case the cars leave the truck.

26,167.—D. M. Cummings, of Enfield, N. H., for an Improvement in Harrow Teeth:

I claim, first, Constructing the tooth, A, of a harrow with prongs, B, sharp-pointed shields, C, substantially as and for the purpose specified.

Second, In combination with the above, the wedge-shaped plate, D, substantially in the manner and for the purpose described.

[Each tooth is furnished with three prongs, and attached to each of these prongs is a sharp-pointed shield, which serve to gage the depth to which the teeth cut. The teeth are adjusted to a greater or smaller inclination, according to the soil in which they have to work, by means of wedge-shaped plates that are placed between the teeth and the frame.]

26,168.—John Davis and Ebenezer Davis, of Matildaville, Pa., for an Improvement in Launching Flat Boats:

We claim the combination of the hinged projection beams, C, with the shoulders, a, pulleys, p, and ropes, d, substantially as and for the purpose set forth, when used in connection with the permanent staging, S.

26,169.—Harrison Doty, of Cardington, Ohio, for an Apparatus for Supplying Sawdust to Furnaces:

I claim the employment of the latch, D, when the same is constructed and arranged to operate substantially as in the manner and for the purpose set forth.

I also claim the arrangement of the hinged bottom, B, provided with the adjustable weight, d, with the latch, D, provided with adjustable weight, a, and with stationary box, A, for the purpose set forth.

26,170.—Charles Douglas, of Hebron, Conn., for an Improvement in Wagon Jacks:

I claim, first, The combination and arrangement of the lever, E, pawl, F, ratchet plate, D, rod, C, and stock, A, substantially as described for the purpose set forth.

Second, The pawl, F, when used for the double purpose of a pawl on the ratchet plate, D, and a fulcrum for the lever, E, as and for the purpose described.

26,171.—C. H. Durkee, of Hartford, Wis., for an Improvement in Grain-binders:

I claim, first, The combination of the traveling segment, D, jointed arm, G, its rod, G', connecting-rod, I, and rack, H, operated by pinion, J, rack, J', when the same are arranged and operate as set forth.

Second, I claim the swinging rack, K, in combination with the traveling segment, D, for receiving and holding the pinion, J, while the end of the arm, G, is being passed through the loop, in the manner set forth.

Third, I claim the loop-holder, c, trip block, d, and block, e, arranged and operating substantially as and for the purposes set forth.

26,172.—Asahel K. Eaton, of New York City, for an Improvement in Vulcaaizing Rubber Compounds:

I claim the use of a metallic bath, substantially as described, for the purposes of vulcanization.

26,173.—Gustavus G. Elias, of Lancaster, Pa., for an Improved Cabbage-cutting Machine:

I claim the specific agrangement and combination of the sliding box, C, with its notches, P, flat spring, N, and retaining-plates, I, the double-coned spiral spring, K, with its square bottom, L, and armed top, H, the counter cutting-knives, 1 2, and central division, 3, on the table, A, provided with legs; the wheel, E, crank or connecting-rods, F, when these several parts are made substantially as and for the purpose specified.

26,174.—E. A. Elliott, of Port Gibson, Miss., for an Improvement in Cotton Presses:

I claim, first, The employment of the hinged forms, B, forming part of the box, A, in combination with the follower, R, said forms being so arranged as to receive the cotton and to act as guides for the follower, substantantially as described.

Second, I claim the employment of the weighted-follower, R, in connection with the spring bolts, g, or their equivalent, whereby the loose cotton is instantly, at the proper time, brought down and held in the proper space, to be acted upon by the followers, F, substantially as described.

Third, I claim the arrangement of the doors, S S and T, with reference to the box, A, and the position of the bale therein, when fully compressed, by means of which I am enabled to apply and secure the covering without sewing, substantially as described.

Fourth, I claim the arrangement of the rod, M, and stops, N N', with reference to nut, H, and its movement, whereby the clutch, L, is not only disconnected from the pulleys, J and K, at the proper times, but also prevented from connecting by accident or otherwise, as described.

26,175.—George August Engelhard, of New York City, and Rudolph Franz Heinrich Havemann, of New Brunswick, N. J., for an Improvement in Compounds of Caoutchouc and Allied Gums:

We claim the described product, obtained by the action of chlorine on gums, such as india-rubber or gutta-percha, whether in solution or in substance, in either of the modes pointed out, or in any other that is substantially the same and which will produce a like effect.

26,176.—A. J. Emlaw, of Grand Haven, Mich., and Elliott Richmond, of Kelloggsville, Mich., for an Improvement in Saw-mills:

We claim, first, The arrangement of the friction wheel, M, and pulleys, I J, in connection with the shafting, E H K, for the purpose of giving the feed and gigging back movement to the carriage, M', as set forth.

Second, The arrangement of the adjustable bars, O, on the carriage, M, screw rods, P, and adjustable wheels, Q, on shaft, R, whereby the bars, O, may be adjusted nearer to or further from each other to suit the length of the stuff to be sawed.

[The subject of this invention relates to certain improvements in that class of sawing-machines in which circular saws are used, and consists in the peculiar manner of hanging the saw arbor, whereby the same may be readily adjusted as circumstances may require. It also consists in a peculiar reversing gear for gigging back the carriage and an improved arrangment of the tail block, whereby the latter may be readily adjusted on the carriage to suit the length of the stuff to be sawed.]

26,177.—Dennis C. Gately, of Newtown, Conn., for an an Improvement in Rubber Belting:

I claim, as a new article of manufacture, machine belting or banding, manufactured with surfaces of india-rubber or gutta-percha, and having surfaces which are as nearly as is practically possible perfectly smooth, as described.

26,178.—Dennis C. Gately, of Newtown, Conn., for an Improvement in Making Rubber Belting:

I claim the method described for manufacturing machine belts or bands of india-rubber or gutta-percha, by rolling them in thin sheets of flexible metal and then heating them, substantially in the manner and for the purposes described.

26,179.—Oliver C. Green, of Dublin, Ind., for an Improvement in Harrows:

I claim the described arrangement of the harrow teeth, a, beams, b, wheels, c, arms, d, lever, e, rods, g, and rack, h, the whole being constructed and operating together in the manner and for the purposes set forth.

26,180.—John Griffin, of Louisville, Ky., for an Improvement in Cotton-harvesters:

I claim the employment or use of annular chambers, E, communicating with the cups, D, of the suction tube or tubes, A C, by means of perforations, b, and communicating with a steam or air chamber by means of flexible tubes, G, substantially as and for the purpose set forth.

[This invention relates to an improvement on a machine for picking or harvesting cotton by steam, for which Letters Patent were granted to the same inventor, bearing date March 8, 1859. The object of the present invention is to economize in the application of the power used or extended in the operation of the machine. This is effected by a novel arrangement, whereby an auxiliary or helping force or power is obtained for detaching the cotton from the bolls.]

26,181.—P. Griswold and H. H. Seeley, of Hudson, Mich., for an Improvement in Grain Separators:

We claim the combination with the screen, D, of the rocking bar, L, and vibrating bar, E, as shown and described, for the purpose set forth.

[This invention consists in giving the lowermost screen in the shoe of the separator a compound movement, and using in connection therewith a supplemental screen having a vertical movement only, whereby the separator, by a very simple mechanism, is rendered very efficient.]

26,182.—John P. Hale, of Kanawha, Va., for an Improvement in Evaporating Vessels:

I claim the superheating of the steam or vapor arising from the evaporation of the brine, substantially as and for the purpose shown and described.

26,183.—A. J. Hall and Russell Patten, of Morristown, Vt., for an Improvement in Carriage Tops:

We claim the construction of bows for folding carriage tops with joints, substantially as and for the purposes set forth.

26,184.—Louis Harper, of Riceville, N. J., for an Improvement in Fertilizers:

I claim, first, The preparation of the peat or muck or lignite, and their mixture with sulphate of lime, soda, potash and magnesia, when required to form the bases of the preparation intended for composition of the fertilizer.

Second, The addition of phosphate and bi-phosphate of lime to the above basis, and the impregnation of the above mixture with ammonia, in the manner described, so as to be converted into simple and double salts, as above stated.

Third, The combination of peat or muck or lignite, prepared as described, with green sand marl.

26,185.—Lewis G. Hoffmann, of Waterford, N. Y., for an Improved Door-fastening:

I claim the described button, as a new article of manufacture.

26,186.—Julius Hornig, of Newark, N. J., for an Improved Cut-off Arrangement for Steam Boilers:

I claim the employment for opening and controlling the closing of the cut-off valve, of a revolving and swinging cam, C, applied in combination with and operated by a revolving wrist plate, D, or its equivalent, and a grooved disk, E, substantially as described.

[This invention consists in the employment for opening and controlling the closing of the cut-off valve, of a cam, constructed, applied and operating in a peculiar and very simple manner, where the cutting-off of the steam variably under the control of a governor, or at any given point in the stroke of the piston under the control of suitable means of adjustment, is effected.]

26,187.—Joshua L. Husband, of Philadelphia, Pa., for an Improved Propelling Wheel:

I claim the combination of the guides, E and F, the arms, A and A', the connecting rods, D and D', the double cranks, L and M, and the sectional paddles, H, operating together, in the manner and so as to produce the effects described.

26,188.—R. W. Huston, of Calais, Maine, for an Improvement in Coal Hods:

I claim the arrangement of the bucket, C, with the external casing, A, when the bucket is provided with a rim or flanch, c, around its top, and with a pin on its bottom, upon which it revolves, and when the external casing is provided with a top which fits snugly around the bucket and over the rim or flanch with a channel, D, and with a door to said channel, the whole being used substantially as and for the purpose specified.

26,189.—George E. Inman, of Buffalo, N. Y., for an Improved Ditching-machine:

I claim, first, The cutter, M, arranged and operating substantially as set forth.

Second, I claim the arrangement of the adjustable roller, L, under the elevated part of the share, C, substantially as set forth.

Third, I claim the arrangement of the caster-wheel, I, plow, G, cutter, M, adjustable roller, L, and plowshare, c c', and side pieces, D, relatively to each other, substantially as described.

Fourth, I claim the arrangement of the two driving-wheels, B B, on the same shaft, when placed so near together as to track within the ditch cut by the horizontal share, c, substantially as described.

26,190.—Luther Johnson, of Grand Ledge, Mich., for an Improvement in Rotary Steam-engines:

I claim, first, The employment, in combination with a sliding abutment fitted to the outer stationary cylinder, of an inner revolving cylinder, having a concentric groove or channel closed permanently in one place by a piston extending all across it, substantially as described.

Second, Operating the abutments, E E', and the cut-off valves, G G', by means of the same cams, F F', through the agency of rollers, g h g' h', or their equivalents, applied to the abutments, and yokes, k k', rods, L L', and levers, M M', and arms, n n, applied to the cut-off valve; the whole arranged and operating substantially as described.

Third, The two sliding reversing valves, applied in combination with the two sets of steam-pipes in relation to the abutments, and operated simultaneously by a single lever, substantially as described.

[This invention consists mainly in a novel system of cams and connections for operating the sliding abutments and the cut-off valves of a rotary steam-engine, and in a novel arrangement of reversing valves for changing the direction of the engine.]

26,191.—H. P. Judson, of Bethlehem, Conn., for an Improvement in Ox Yokes:

I claim the arrangement of the peculiar rotary spring disk, D, curved rods, F G', and horizontally moving locking bolts, B B', as and for the purpose shown and described.

[This invention consists in arranging two bolts, each having beveled ends, upon a plate which is secured over the bow hole in the yoke beam, so that each bolt will be acted upon by suitable springs and connecting-rods, inclosed under the plate above mentioned in such manner that they will approach and recede from each simultaneously. It also consists, in conjunction with the before-mentioned bolts, in tapering the end of the bow to a point, so that, by pressing this point between the ends of the bolts, they will open and allow the bow to be inserted in its place, and when thus inserted, they will simultaneously close and lock the bow securely to the beam. The operation of unlocking is simply to turn a small pin on top of the beam, when they will both instantly open and permit the bow to be removed.]

26,192.—Cheney Kilburn, of Burlington, Vt., for an Improved Lathe Attachment:

I claim the rotating reciprocating knife, D, in combination with the carriage, B, provided with the gouging tool, F, and V-shaped cutter, G, pattern, L, recess, H, and support L', when arranged and operated as set forth and for the purpose specified.

26,193.—Elisha C. Leonard, of New Bedford, Mass., for an Improvement in the Manufacture of Paraffine Candles:

I claim my improvement or improved process of treating paraffine in the manufacture of candles therefrom, whereby I am enabled to dispense with a refrigerating air bath cooled by artificial means, my improvement or invention consisting in the employment, in manner described, of the atmospheric temperature and the refrigerating water bath after the first cooling of the candle in the water bath.

26,194.—Edward J. Mallett, of New York City, for an Improvement in Railroad Car Axles:

I claim the combination and arrangement of the parts as represented for the purpose of forming an axle on which the wheels shall have an independent motion, the whole constructed substantially as described for the purpose set forth.

26,195.—Charles F. Mann, of Troy, N. Y., for an Improvement in Traction Locomotives Carrying their own Railway:

I claim so applying the endless chains, A, as to make them not only the track for the supporting wheels, B, of the locomotive to run on, but also the means by which the engine propels the locomotive along the ground, substantially as described.

26,196.—James J. Mapes, of Newark, N. J., for an Improvement in Fertilizers:

I claim the production of a fertilizer by combining guano and sulphate of ammonia, or its equivalent with burnt bones, or their equivalents, when the said bones, or equivalent, have been treated by sulphuric acid, as specified; the whole being prepared substantially in the manner and for the purpose set forth.

26,197.—Thos. J. Mayall, of Roxbury, Mass., for an Improvement in Scythe-rifles:

I claim, as a new article of manufacture, a rifle for sharpening scythes, &c., formed of india-rubber or gutta-percha, with which emery, sand, or other suitable gritty substances, are incorporated, substantially as set forth.

29,198.—Wm. Morrison, of Carlisle, Pa., for an Improvement in Harvesters:

I claim providing the rear end of the finger with the open slot, d, whereby I am enabled to readily remove the stationary cutters and fingers, and to replace them without detaching the bolts or nuts which secure the fingers to the finger-bar, in the manner and for the purpose specified.

26,199.—Martin Nixon, of Philadelphia, Pa., for an Improvement in Boilers for Treating Paper Stock:

I claim the close spherical kier or boiler, A, journaled on hollow trunnions, B, and provided with a perforated floor, F G, steam-pipes, D and E, and elevating and distributing pipes, I and J; the whole being constructed and arranged and operating substantially in the manner set forth, to boil paper stock under a heavy pressure, by the combined action of an upward current of steam and a downward current of hot alkaline solution, and admitting of the ready inversion of the said boiler for the discharge of its contents when cooked.

26,200.—John K. O'Neil, of Kingston, N. Y., for an Improvement in Vapor Lamps:

I claim the arrangement of the auxiliary burner, G, in connection with the gas generating chamber, E, in such a manner that a cessation of its action on said chamber may at any time be effected without extinguishing its light by the separation of said burner from its

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influence on said chamber, as described, and for the purpose specified.

I also claim the spiral revolving shade in combination with the auxiliary burner, as described, and for the purpose set forth.

I also claim the construction and arrangement of the burner, G, and graduating tube, g, in combination as described and for the purpose specified.

26,201.—Wm. Pearson, of Windsor Locks, Conn., for an Improvement in Sewing-machines:

I claim the combination of the vibrating looper, the cam flange which operates it, and the vibrating bar, J, carrying the friction rollers, j j, the parts being constructed, combined and arranged substantially as and for the purposes set forth.

26,202.—J. B. Palser and G. Howland, of Fort Edward, N. Y., for an Improvement in the Manufacture of Paper Pulp:

We claim the boiling of the straw or other stock for about four hours, undey a pressure of from 110 lbs. to 130 lbs., in a solution of caustic alkali, of a strength indicating from 3½° to 3¾° Beaume, substantially in the manner and for the purpose set forth.

26,203.—Wm. Phelps and W. H. Hanford, of Sycamore, Ill., for an Improvement in Horse-power Machines:

We claim the combination and arrangement of the wheels and rollers, C C C and D D D, on truck, B, and wheel, H, and friction rollers, I I I and J J J, on track, H, and friction rollers, R R R, on rotary track, O, with rotary drive wheel, N, and friction rollers, U, constructed and operated substantially as described.

26,204.—Francis B. Richardson, of Boston, Mass., for an Improvement in Elastic Enema Syringes:

I claim the improvement in india-rubber syringes, as an article of manufacture, which consists in combining the india-rubber or gutta-percha, or other waterproof bag, with the suction end of the syringe, in the manner substantially as described.

26,205.—T. J. W. Robertson, of New York City, for an Improvement in Sewing-machines:

I claim, first, The employment, in combination with the needle of a sewing-machine, of a plate, K, constructed and operating substantially as shown and described, for the purpose of laying and holding braid, gimp, or other material, upon the surface of the fabric, as set forth.

Second, The arrangement of the guides, e e e, to extend past the center and on each side of the needle-hole, as and for the purpose set forth.

Third, The employment, in combination with a braid-holder, M, of the adjustable slide, N, for the purpose of flattering and opening the braid and preventing its kinking, as shown and described.

26,206.—John A. Seaman, of St. Louis, Mo., for an Improved Machine for Chamfering and Crozing Kegs or Casks:

I claim the rotating arms, a, provided with the adjustable jaws, b, the adjustable rotating ring, G, fitted to the annualar plate, D, by the screws and guides, E F, the plate, D, being providing with the tool-holding levers, I J, attached to the guide-shafts, C, and supported by the springs, E, and the shafts, C, connected to a treadle frame, H, the whole being combined and arranged to operate substantially as and for the purpose set forth.

[The object of this invention is to obtain a machine whereby kegs may be howelled and crozed, and formed complete ready to receive the heads, the work being performed very expeditiously in a perfect manner, and with but the aid of a single attendant or operator.]

26,207.—Lemuel W. Serrell, of Brooklyn, N. Y., for an Improvement in Guides for Sewing-machines:

I claim, first, A spring tucker, B, acting to fold the edge of the hem against the plate of the hemmer, when combined with the adjusting screw, 5, or its equivalent, whereby the pressure of the tucker on the goods and the opening or mouth left for their passage are regulated, as set forth.

Second, I claim the horn, 5, in combination with the tongue, e, for the purposes and as specified.

Third, I claim the arrangement of the hem-spreader stock, h, and gage, d, for the purposes and as specified.

Fourth, I claim attaching the guide or hemmer to the sewing-machine by a cylindrical pin or hinge to permit the said guide or hemmer to be turned up or inverted, so that the edge of the cloth, at the beginning of the hem, can be properly entered and folded while in this position, as set forth.

26,208.—Daniel Spencer, of Courtlandt, N. Y., for an Improvement in Grain Separators:

I claim the combination with a grain separator between the fan shaft and the separating screens of a shaft, H, and a series of sliding wheels, I, substantially as shown for the purpose set forth.

[The object of this invention is to obtain a simple and efficient means for regulating the speed of the shake movement of the separators, so that the vibrations of the same may be quicker or slower as may be required, without changing the speed of the fan. In order to separate grain from foreign substances by means of screens, the shake motion of the latter should being according to the state or condition of the grain. If very dirty, and mixed grain is to cleaned and separated, the screens should have a quick movement in order to work effectually. And if the grain be but little mixed and tolerably free from dirt, a slow movement would be required, as as a quick movement in the latter case would cause a portion of impurities and foreign substances to pass through the screen with the grain.]

26,209.—John F. Stark, of Greensburgh, N. Y., for an Improved Composition for Protecting and Ornamenting the Surface of Wood:

I claim the employment of a compound composed of sulphur and alcohol, or sulphur and the alcoholic varnish described, in the proportions and manner shown and described for the purpose set forth.

[This invention consists in the use of sulphur in a crystaline state, in combination with alcoholic varnish, for the purposes of covering surfaces of wood, or other material, to protect or give an ornamental appearance thereto.]

26,210.—James Stratton, of Brooklyn, N. Y., for an Improved Apparatus for Regulating the Pressure of Water in Pipes:

I claim the employment or use of the air-chamber, E, diaphragm, D, or its equivalent, with valve, C, attached, the pipe, B, containing valve, C, and communicating with the air-chamber by pipe, F, provided with the cocks, H I, and the pipe, G, communicating with the pipe, F and B; the above parts being arranged in relation with each other and the supply pipe, A, to operate as and for the purpose set forth.

26,211.—L. Taylor, of Jordan, Wis., for an Improvement in Apparatus for Elevating Water from Wells, &c.:

I claim, first, The employment or use of the springs, D, arranged in connection with traveling jackets, G I, and receivers, B B, to operate as and for the purpose set forth.

Second, The means, substantially as shown, of connecting the bucket, I, to the carriage, J, to wit, the lever, x, on the carriage, provided with the loop, w, and the bail, w', of the bucket, with its pulley, v, in connection with the pulleys, e', on the carriage and the taper rod, g', and catch, h', in the well-house, L, whereby the bucket is drawn up the wire or way and dropped and raised from the well.

[This invention relates to certain improvements in that class of water-elevating devices in which the buckets or pails are connected to carriages that run on inclined wires or ways from the well or spring to the house. The object of the invention is to facilitate the application of the device or its adaptation in all cases where ii may be applied, and at the same time facilitate the operation of the bucket both as regards its travel over the inclined wire or way its filling and emptying, also the proper manipulation of the same to ensure the durability of the device.]

26,212.—Saml. Thomas and John Thomas, of Cattasauqua, Pa., for an Improvement in Air-heating Pipes for Blast Purposes:

We claim supporting both of the legs of the arched pipes, G, upon one bottom tube, constructed substantially as described, so that injury to said pipes, by the displacement of the bottom tubes will be prevented; and so that each bottom tube, with its connected arched pipes, may be removed and replaced, without disturbing any of the remaining arched pipes, or bottom tubes, all as set forth.

26,213.—Thos. Tripp, of Buffalo, N. Y., for an Improved Propeller Wheel:

I claim a propeller wheel, having blades formed in respect to their main propelling surfaces, and also in respect to their outward arcs, substantially as described.

26,214.—David Walling, of Garrettsville, N. Y., for an Improved Washing-machine:

I claim the combination of weighted arms, D D, jointed connecting-rod, H, angular lever, G, rod, a, vibrating dashboard, K, and dash-board, M, when the same are all arranged and to operate as set forth.

[This invention consists in a peculiar arrangement of levers and weighted arms with a vibrating dashboard, and a fixed vibrating dasher, so that the operation of cleaning the clothes is effected with a very little manual labor, so little that a child may operate the machine with perfect ease.]

26,215.—M. D. Wells, of Morgantown, Va., for an Improved Washing-machine:

I claim the reciprocating plunger, operated as described, in combination with the rack piece, D, moved by the plunger, in its backward motion, and springs, d d, throwing said rack in place, the whole operated as specified.

26,216.—J. Whiteside and H. F. Crabill, of Fuller's Corners, Ind., for an Improvement in Cultivators:

We claim, first, The arrangement and combination of the hinged, curved shovel beams, A A, cross-bar, D, and gaging wheel, F, substantially as and for the purpose set forth.

Second, The curved draught-beam, B, arranged as described, in combination with the cross-bar, D, handles, G, and rod, h, substantially in the manner and for the purpose specified.

[This cultivator is arranged with two curved shovel-beams which can be used with their concave sides facing each other, and also reversed bringing their concave sides towards each other, whereby it adapts itself to a great variety of work. The width of the shovel-beams is determined by means of a cross-bar, which carries a gaging wheel to govern the depth of the shovels cut. The draught-beam is so arranged that the clevis can be attached to one end or to the other, according to the position of the shovel-beams, and a rod connecting the two ends of the draught-beam forms the guides for the handles whenever the position of the shovel-beams is changed.]

26,217.—R. G. Wilkins, of Burns, N. Y., for an Improved Washing-machine:

I claim, first, The combination of an upper rotary rubber, with revolving slats, with two or more lower rotating rubbers with revolving slats, arranged substantially as described for the purpose set forth.

Second, I claim arranging the undulating surface of the slats in the upper rubber, so the projections come opposite to each other throughout, when the same is combined with a lower rotating rubber in which the projections of one slat are arranged opposite the depressions in the adjacent slats, and also when the slats of the upper rubber are arranged in relation to the slats of the lower rubber, as described, for the purpose set forth.

26,218.—John Williams, of Ashfield, Mass., for an Improved Washing-machine:

I claim the combination of straight fluted rollers, placed in the box of the machine in the form seen in the model, and two arms connected by a handle at one end, and attached by the other to the extremities of the frame which holds the four rollers.

26,219.—E. A. Willis, of Cold Spring, N. Y., for an Improvement in Floating Batteries:

I claim the combination of the central upright shaft, so applied that it may serve to anchor the battery, and that the battery may revolve around it, and a system of propellers by which the battery may be either caused to revolve around the said central shaft while at anchor, or propelled from place to place, when the said central shaft is elevated, substantially as described.

26,220.—T. W. Wilson and Lewis Raymond, of New York City, for an Improved Disengaging Hook for Liberating Ships' Boats:

We claim the combination of a detachable hook, consisting of an open eye and pin combined with each other, substantially as set forth with a pulley block for lowering a boat.

We also claim the combination of a detachable hook with the davit, or object from which a boat is lowered by means by means of a lanyard, that is independent of the lowering tackle, in such manner that the combination as a whole operates to free the boat from the tackle by the taughtening of the lanyard.

26,221.—Michael Werk, of Cincinnati, Ohio, for an Improvement in Lining Tanks for Fatty Acids:

I claim the lining of the tank or metal vessel used with wood and cement, in the manner set forth.

26,222.—C. M. Wilkins, of Madison, Ohio., for an Improved Cheese Vat:

I claim the arrangement of the valves, N and O, within the water chamber and vat, substantially as described.

26,223.—Sylvester P. Wheeler, of Bridgeport, Conn. (assignor to Moses H. Wheeler & Co., of same place), for an Improvement in Manufacture of Nitrate of Silver Crayons:

I claim the manufacturing or forming of sticks or pieces of nitrate of silver or lunar caustic, with one or more wires or ribbon of metal running through the same, to which the nitrate of silver or lunar caustic adheres and still holds to the wire, wires or ribbon, when used or otherwise, when broken.

26,224.—Harry Abbott, of North Huron, Ind. (assignor to himself and Emerson Abbot, of same place), for an Improvement in Centrifugal Water-wheels:

I claim the combination, with a centrifugal water-wheel, A, of a valve, E, located and arranged within said wheel so as to turn with it, and, at the same time, be adjustable while the wheel is in motion, by means of the bail, c, concentric rod, H, and adjusting-lever, I, substantially as set forth.

26,225.—J. A. Althouse, of Philipstown, Ill. (assignor to himself and F. W. Lechtenberger, of New Harmony, Ind.), for an Improvement in Machines for Raking and Loading Hay:

I claim the combination of the stationary rake, C, revolving rake, I, and vibrating rake, K, placed on a mounted frame, and arranged for joint operation substantially as and for the purpose set forth.

[This invention consists in the employment or use of stationary, revolving and vibrating rakes, mounted on wheels and arranged for joint operation, whereby hay or grain may be loaded on a wagon or cart with far greater facility than by the usual exclusively manual process.]

26,226.—Gillett Bunting, of Liberty, Ind. (assignor to himself and W. M. Jarrell, of same place), for an Improved Churn-dasher:

I claim producing the vibratory movement in the cylindrical churn-dasher, by means of the combination of said arms with the crank portion of the driving-wheel and intermediate connecting rod, when these are used in connection with the current-breaker, K, as set forth.

26,227.—James T Coxell, of Brooklyn, N. Y. (assignor to himself and Edward Jones, of same place) for an Improved Mangle:

I claim, first, The arrangement of the rollers, A B B, above the table, so that the fabric will be folded by the machine, substantially as shown and described.

Second, The combination with the weighted levers, L, of the lifting ropes, F, or their equivalents, so that the downward pressure of the roller, A, may be released, and the roller lifted at the will of the operator to allow such portions of the linen that have buttons or other elevations to pass through the machine uninjured, all as shown and described.

26,228.—H. E. Fickett and John W. Summers, of Glenns Falls, N. Y. (assignors to H. E. Fickett, aforesaid), for an Improved Bed Bottom:

We claim the arrangement of the slats, B B B B, with the spiral springs, C C C C, wires, D D, central supports, E E E E, and cross-brace, F, arranged and operated in the manner described and for the purpose specified.

26,229.—Horatio P. Gatchell, of Ravenna, Ohio (assignor to E. J. Bates, of Bedford, Ohio), for an Improvement in Coffee Pots:

I claim the forming of the walls of the cups, B C and F, with male and female screws, as described, in combination with the perforated bottoms, E and E', for the purpose of compressing the ground coffee and extracting the strength of the drug by displacement, in the manner specified.

26,230.—Wm. Darker, (assignor to himself and J. B. Thompson) of Philadelphia, Pa., for an Improved Mode of Applying Steam as a Motor to City Railroad Cars:

I claim, first, Placing a steam-engine and steam generator on the top of a city railroad car, when the engine, by suitable driving-mechanism, is connected with the wheels of the car, to propel the same.

Second, Connecting the governor, N, with a throttle valve and brake arranged substantially as shown to operate as set forth,

Third, The particular arrangement of the brake, formed of the strip, Z, on wheel, K, and actuated by the movement of the yoke, Y, on its bent ends, e e, connected with the hand lever rod, V, substantially as shown, so as to allow of the adjustment of the throttle valve by hand independently of the automatic connection.

Fourth, The arrangement of the bar, A', cam, N, lever, B', and rod, H, connected with the bar, A', by the arm, G, whereby the brake is operated automatically, as set forth.

[The object of this invention is to apply steam as a motor directly to city railroad cars, in such a manner that the necessary machinery employed will not be cumbersome, and entirely out of the passengers' way, and at the same time so arranged and adapted to the car as to preclude the possibility of the engineer or attendant running the car beyond a proper speed, and also insuring a perfect control of the speed of the car in descending grades. The invention will be understood by the above claims.]

26,231.—Augustus J. Goffe and Demus Goffe, of Cohoes, N. Y., (assignors to Downs & Company, of Seneca Falls, N. Y.) for an Improvement in Knitting-machines:

We claim the rotary burr-presser, M, having inclined planes, a, between the teeth, in combination with the sliding needles arranged and operating substantially in the manner and for the purpose shown and described.

We also claim varying the eccentricity of the groove, f, by means of the movable pulley, g, spring, k, adjusting-screw, h, and friction-pulley, l, substantially in the manner and for the purposes herein described.

26,232.—Liveras Hull, of Charlestown, Mass., (assignor to himself and A. Wheeler, of Boston, Mass.,) for an Improved Method of making Copal Varnish:

I claim my new manufacture of varnish, as composed of gum copal, camphene and alcohol, united in the proportions in a cool state, in a closed or air-tight vessel, substantially as specified.

26,233.—Henry W. Joslin, of Trenton, N. J., and A. K. Eaton, of New York City, assignors to the Joslin India-rubber Company of New York) for an Improvement in the Treatment of India-rubber:

We claim the treatment of the argilaceous red shale of New Jersey or other similar geological localities, in combination with sulphur and caoutchouc, substantially in the manner and for the purpose described for the manufacture of india-rubber.

26,234.—James S. McCurdy, of Brooklyn, N. Y., (assignor to J. H. Myers, of New York City) for an Improvement in Sewing-machines:

I claim the vibrating lever, g, carrying the shuttle-driver, h, and provided with the spring, k, to keep the shuttle-driver to the raceway, the whole constructed and operating as and for the purposes specified.

26,235.—Henry M. Scott, (assignor to himself and Samuel Adlam) of Portland, Maine, for an Improved Bed-bottom Spring:

I claim the employment of spring hooks, A, and clamps, D, substantially as described, for the purpose of attaching strips of webbing to the frame of a bedstead.

[By means of this spring the employment of webbing for bed bottoms is rendered practicable. The ends of the webbing are securely held over their entire width, and the sack can be taken in without much trouble.]

26,236.—Parmenas P. Parkhurst, of Princeton, Mass., for an Improved Ore Separator:

I claim the washing-box or chamber, a, constructed with the pipe, b, entering near the bottom, to cause a whirl and circulation, as specified, and with the gate or overflow, c, for the purposes and as described and shown, and in combination with such washing-box, a, I claim the receptacle or box, e, and chamber, f, to receive the metallic particles when the gate, d, is raised, as set forth.

26,237.—John Thomas, (assignor to himself and John M. Lord) of Indianapolis, Ind., for an Improvement in Piling Railroad Bars for Re-rolling:

I claim the tie No. 7, or its equivalent, when used for interlocking T-rail or other old iron, and forming the pile of six rails, shown in Fig. 1, when constructed and arranged as and for the purposes set forth.

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26,238.—E. T. Weeks, (assignor to S. H. Babcock) of Franconia, N. H., for an Improved Shoe-pegging Machine:

I claim the feeding-device formed of bar, L, to which the jaws are connected, operated by the screw, K, ratchet, S, and pawl, T, lever, U, and pitman, V, substantially as and for the purpose set forth.

I also claim, in connection with the riving or splitting knife, the gage, I, arranged as and for the purpose specified.

I further claim the elastic or yielding bar, Q, when attached to the arbor, M, provided with cam, d, and used in connection with the segment rack, P, curved bars, N O, and jaws, k l, for the purpose set forth.

RE-ISSUES.

Berresford Maria King, of New York City, Executrix of Valentine Hall, deceased, late of said New York City, for an Improvement in Apparatus for Cooling Liquids. Patented Sept. 20, 1859:

I claim, first, The employment or use of one or more receivers, A B, with or without the pump, E, placed on a tank, F, containing ice water or water at a low temperature, and connected together and to the liquid supply pipe, substantially as and for the purpose set forth.

Second, The employment or use of one or more receivers, A B, placed within a tank, F, and connected with the barrel or cask, H, by means of a siphon, I, and with a pump, E, within or at the outer side of the tank, for the purposes set forth.

Third, The combining of a pump, E, with one or more receiver, A B, connected together and made to communicate with each other by siphons, C D, when said parts are submerged within a tank, F, and made to communicate with the barrel or cask, H, by means of a siphon, I, extending over the top of the tank, substantially as and for the purpose set forth.

[This invention consists in placing one or more receivers, with or without a pump, within a tank supplied with ice water, or water at a low temperature, and connecting together said receiver or receivers and the pump, if one be used, by means of a siphon or siphons which are placed in communication with the supply pipe, whereby liquids can be drawn in a cool state direct from the supply pipe, and the refrigerating device readily cleaned when necessary, all the parts being rendered very accessible. See engraving in No. 18, present volume.]

Joseph W. Fawkes, of Christiana, Pa., for an Improvement in Machines for Plowing. Patented Jan. 26, 1858:

I claim, first, The employment, in combination with the locomotive, of a bilge-shaped driving-wheel, substantially as set forth.

Second, I do not claim broadly the invention of movable spurs; but I claim the combination of the sliding spurs, k k, with the bilge-shaped driving-wheel, E, as shown and described.

Third, The arrangement of the adjustable frame, plows, gage-wheel, driving-wheel, engine, boiler, and guiding-wheels, as shown and described.

Septimus Norris, of Philadelphia, Pa., for an Improvement in Running Gear of Locomotive Engines. Patented Sept. 26, 1854. Re-issued March 2, 1858:

I claim the combination of a free vibratiug-truck, with six or more driving-wheels, when the front pair of drivers is placed in advance of the center of gravity of the entire engine, substantially as and for the purposes set forth.

William Oldham, of Buffalo, N. Y., for an Improvement in Steam-boilers. Patented June 7, 1859:

I claim, first, The central water space, F', in the combustion-chamber, F, arranged in relation to the annular water space, F'', and to the tubes, D, or their respective equivalents, substantially as set forth.

Second, Placing the annular sheet, G, and horizontal plate, I, (which with the jacket form the smoke-pipe, M), outside of the water space to allow the sediment to be conveniently removed from the water space, in communication with the described arrangement of the return tubes, D, substantially as set forth.

DESIGNS.

Elemir J. Ney, of Lowell, Mass., (assignor to the Lowell Manufacturing Company) for a Design for Carpet Patterns. (2 cases.)

ADDITIONAL IMPROVEMENT.

Benjamin F. Wells, of Georgetown, D. C., for an Improvement in Naval Architecture. Patented Oct. 18, 1859:

I claim making the lines of every section of a vessel from the keel to the water line arcs of circles, when said arcs have separate and independent centers determined substantially in the manner described.

EXTENSIONS.

Christian [illegible]V. Queen, of Peekskill, N. Y., for an Improvement in Forges. Patented Nov. 18, 1845:

I claim the combination of the curved sliding shutters for enclosing the space over the fire, and the device for admitting a draught of air to keep up the combustion during the intervals in which the bellows are not employed; the same being effected for the purpose and substantially in the manner made known,

Joseph E. Anderson, of Boston, Mass., for an Improvement in Planing-machines. Patented Nov. 21, 1845:

I claim the manner shown of forming, arranging and combining with the revolving cutter-wheel, the revolving platform and the endless aprons between which the board to be planed is to be passed, by means of which arrangement and combination it is firmly held along the whole length of such apron and carried regularly forward without deviation.

George Faber, of Canton, Ohio, for an Improved Magnetic Water Gage for Boilers. Patented Nov. 26, 1845:

I claim the method herein described, or any other substantially the same, of indicating the rise and fall of water in a steam-boiler or generator by means of an indicator outside thereof actuated by a magnet connected with a float or any other body within the boiler that rises and falls with the water and connected with the magnet, substantially as described.

NOTE.—The above list of patents contains THIRTY-ONE which were prosecuted through the Scientific American Patent Agency. Although not so many as we frequently obtain, some weeks, we consider it a very good week's business from one agency.

Literary Notices.

EDINBURGH REVIEW. Published by Leonard Scott & Co., this city.

The present number of this, the oldest of the British reviews, contains ten able essays, each worthy of the days when Jeffrey was *its* editor. The first is a review of A. Bains' new work on "Psychology," and the last one is on the "Secret Organization of Trades" in England. It is stated in this article that a strike of workmen was once concocted to defeat the election of Sir Joseph Paxton to the British Parliament; and that it was got up by a political cabal, who bribed the ringleaders among the workmen.

THE ATLANTIC MONTHLY. Ticknor & Fields, publishers, Boston.

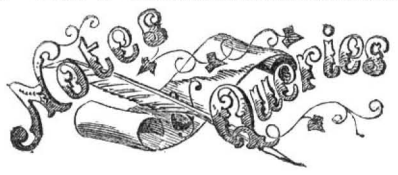
The December number has the concluding chapters of "The Minister's Wooing" and "The Professor at the Breakfast Table." The new publishers affirm, in italics, that "'The Atlantic' has never been, and will never be, a sectional journal."

THE MATHEMATICAL MONTHLY J. D. Runkle, A. M., A.A.S., editor; Ivison & Phinney, this city, publishers.

Tuis is a magazine of some 40 pages, printed on excellent paper, in beautiful style, and devoted wholly to the discussion of mathematical problems. We suspect its circulation is hardly equal to that of the "New York Ledger."

NEW YORK COACHMAKERS' MAGAZINE. Published by E. M. Stratton, this city.

This very interesting magazine has reached the seventh number of the second volume, and doubtless is appreciated by the very large class of mechanics and manufacturers to whose interests it is devoted.



E. M. R., of Va.—According to your recollection, if Robert Stephenson had not magnanimously declined the usual allowance made to vessels of the size of his yacht "Wave," he would have beat the "America" in the famous race. We remember reading, in an English publication devoted to such matters, a very good-natured and very graphic account of the race. The writer said that, as his party rode along in the edge of the evening through the immense crowds who were wending their way homeward, they had constant occasion to reply to the hail, "Is the 'America' ahead?" "Yes." "What is next?" "Nothing."

R. M., of Pendleton.—We do not remember to have received any specimen of copper from you. You had better send another to E. N. Kent, No. 30 Wall-street, this city, for analysis.

P. C., of Pa.—You are required by law, on presenting an application for a patent, to define, and, at the same time, clearly and honestly explain, your invention. If you have failed to do this, you have no right to complain of the Commissioner of Patents for refusing to grant you a patent. Inventors sometimes think they can get a patent without explaining their secret. This is absurd, as the law could give no protection to an inventor unless he fully explains his invention, and then only after being satisfied that it is new and entitled to a patent.

H. W. W., of Ky.—It is generally acknowledged that pure sperm is the best oil for lubricating machinery. Although higher in price than other oils, it is not considered more expensive, because it affords such good results, and is the most durable. This opinion we have derived from several machinists, who have tried various kinds of oils. A cheaper oil, equally as good, is desirable, because a vast annual expenditure on railroads and in factories is incurred for this lubricator. Common whale oil can be much improved for lubricating purposes, by boiling it with salsoda for half an hour. About one ounce of soda only is used to the gallon; and when boiled, it is allowed to settle until a sediment falls to the bottom. The clear is then run off, and used for the machinery.

C. O. R., of N. J.—We decide not to publish the article you send us, upon the cut-off and throttle-valve, taken from a daily paper. We will state, however, that the objection urged by the writer to the operation of the cut-off by the governor is absurd; for the same objection would apply to all high-pressure reciprocating-engines, whether governed by the cut-off or not; or even if they worked under the full head of steam throughout the stroke. The cut-off has nothing to do with such an effect as he described.

N. P. M., of Ohio.—It is a law in mechanical work that action and re-action are equal. The ball would not fall with greater force than that required to make it ascend.

J. C., of Mass.—You complain that we did not answer your letter in regard to the probability of your being able to find a market here for your patent clocks. If you will stop and reflect a moment, you will see that such a question does not belong to us to investigate and answer. Simply because you are one of our subscribers does not "entitle" you to our time in looking up information about the state of the clock market. Our paper is supposed to be worth the subscription price, else you would not take it. Our rule is to show courtesy to all our readers alike; but we do not recognize the principle that a subscriber, because he is a subscriber, has a right to demand our time in a business matter without compensation. We carefully answer all inquiries put to us by our readers, when we can do so without a great sacrifice of time; and we have their repeated assurances that they get from us, freely, information they could not obtain elsewhere for money.

S. B., of N. J.—If, as you state, thunder or electric clouds are always minus, and the earth plus, then no discharges to the earth can take place. In other words, were your views correct, no house, tree, man or beast would ever be lightning-struck.

I. A. S., of Pa.—You appreciate the advantages of having the extremity or point of the lightning-rod made of a good conductor; hence, you are right in condemning the use of German-silver points. A silver point is better than one of platina, because it has nearly thrice the conducting capacity. Platina, however, is so difficult to fuse, and a silver point is so liable to be melted by a heavy discharge of the fluid, that the platina, on this account, some may prefer it.

W. M., of Ky.—H. Bailliere, No. 440 Broadway, this city, is the agent for Muspratt's chemistry.

B. & O., of N. Y.—H. B. M. Birkenbine, Chief Engineer of the Philadelphia Water-works, has charge of the very interesting experiments in relation to the power of the various turbine wheels. By writing to him, you can ascertain whether you are too late too have your wheel tested.

J. M., of Mich.—On examination, we find that our statement in regard to the first locomotive used in this country was correct. It was, in 1831, on the Mohawk and Hudson Railroad.

S. E. R., of Pa.—Your question is, Will water passing on to an overshot wheel, through an opening one foot in hight, do more work when the supply in the forebay is 8 feet high than when it is but one foot high, the supply being constant in both cases?" We answer, it will depend entirely on the direction in which the water strikes the wheel; if it strikes it so that the momentum will be expended in turning the wheel, as will generally be the case, then the wheel will run faster when the water is high in the forebay.

J. C., of Mount Pleasant.—Attempts have been made to drive machinery with gunpowder, and if they had been successful the light engine to fly with would have been produced. Two difficulties were encountered—the force was too sudden, and the smoke fouled the machinery. We do not think your plan practicable.

W. A. M., of Mass.—We know of no substance more certain to explode, on being struck, than fulminating mercury, with which percussion caps are charged. Atmospheric air, on being suddenly compressed, will yield sufficient heat to kindle phosphorus.

D. M. C., of N. Y.—There are two causes of the prolonged sound of thunder. One is that the lightning generally moves in a direction somewhat towards or from the spectator, and the sound produced nearest him reaches him sooner than that produced at greater distances. Another reason, assigned by Professor Pearce, is the varying densities in the different strata of air and cloud through which the sound passes. Your questions in astronomy are of the most elementary character, and could be answered only at considerable length. We must refer you to some work on astronomy. Professor Olmstead's will be suitable for you.

E. M. R., of Va.—Singular nouns ending in s (single) form the possessive by taking an apostrophe and s. There are good authorities for omitting the second s, but we notice that most of the good writers in this country and England now adopt the rule which we have given. Morgan James, of Utica, and Daniel Fish, of No. 66 Fulton-street, this city, are ranked among the best rifle makers in the State of New York. "The American Rifle," by Chapman, is said to be a good work. The October number of the "Atlantic Monthly" has a good article on the rifle. You will find an illustration of the lime stove invented by W. W. Albro, of Binghamton, N. Y., on page 281, Vol. XI., of the SCIENTIFIC AMERICAN.

J. R. A., of Conn.—The SCIENTIFIC AMERICAN is the only work, published in this city, that contains a list of all the patents granted since 1847.

H. R., of Mass.—We are aware that you are a joint patentee with Mr. Leonard, in the method of manufacturing parffine candles, for which the patent was issued on the 8th of February last, but Mr. Leonard is the inventor; hence we gave him credit, and no other person has the right to claim any glory for the improvement.

S. S., of N, J.—You can make a beautiful, quick-drying varnish for paper or linen, as follows:—Take gum sandarach, 8 oz.; Canadian balsam, 4 oz.; and dissolve them in a quart of alcohol. Varnish made with gum resins and turpentine do not dry so fast as those made with alcohol, but they are not so liable to crack.

H. W. C., of N. Y.—A very small amount of sulphate of iron should be used in making black ink with logwood; an ounce is sufficient for a gallon.

C. T. M., of S. C.—You can put up a line of telegraph in any part of California and use a visual signaling telegraph like that employed in England; but if you use an electro-magnet to make records or produce signals of any kind, it would be considered an infringement of the Morse patent.

S. H., of Del.—Two sets of blocks and falls rove fourfold and set up on angle frames are sufficient to elevate a steeple-frame of 7,000 pounds weight. You must be careful in securing the frames so as to have them sufficiently strong, to prevent their breaking when raising the steeple.

J. K., of Del.—Resin gas possesses double the illuminating power of coal-gas, but we cannot tell you the relative value of the gas made from saw-dust, to which you refer.

H. J. G., of N. Y.—Solar oil is simply a market name for a certain quality of coal-oil.

Money Received

At the Scientific American Office on account of Patent Office business, for the week ending Saturday, Nov. 26, 1859:—

A. D. H., of Mich., $25; J. S., of R. I., $25; D. S. H., of R. I., $30; J. C., of N. Y., $55; E. & C., of N, Y., $30; J. J. A., of N. C., $25; G. A. W., of N. Y., $30; J. C. W., of N. Y., $25; N. A. P., of Tenn., $30; J. Q., of N. Y., $30; M. & B., of R. I., $25; R. M. C., of Mich., $30; J. H., of Ill., $40; E. L., of N. Y., $30; D. De F. D., of Mass., $30; B. & C., of N. Y., $30; W. S. M., of Pa., $60; S. & R., of N. Y., $65; I. S., of N. Y., $30; I. M. L., of R. I., $30; P. T., of N. J., $30; E. M. & J. E. M., of N. Y., $35; E. P. M., of Mass., $30; L. B. D., of Wis., $25; J. S., of Ohio, $30; W. A. G., of N. Y., $30; H. A. M., of N. Y., $100; J. T. R., of Pa., $30; A. R. W., of Pa., $30; M. P. W., of R. I., $30; V. M. B., of Pa., $30; L. B. D., of Wis., $60; G. K., of N. Y., $10; L. S. C., of N. Y., $110; M. K., of N. Y., $30; J. E. E., of Cal., $10; M. & H., of Mass., $25; R. W. H., of Ga., $35; F. O., of N. Y., $25; N. A., of Conn., $55; D. N., of Ill., $25; I. P. L., of N. Y., $10; R. N. T., of Conn., $30; L. F., of N. Y., $30; S. B., of N. J., $30; B. S. C., of N. Y., $30; G. H. S., of Mass., $30; E. P., of Pa., $30; W. D., of Ill., $10; M. C., of Mass., $55; J. F. H., of N. Y., $25; W. B. C., of L. I., $57; J. P. G., of N. Y., $55; H. B. J., of N. J., $25; C. H. D., of Miss., $55; W. T., of N. Y., $30; J. D. B., of Vt., $30; B. D. & F., of Pa., $30; O. M. P., of Ill., $25; G. B. L., of N. Y., $30; T. H. B., of N. Y., $25.

Specifications, drawings and models belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, Nov. 26, 1859:—

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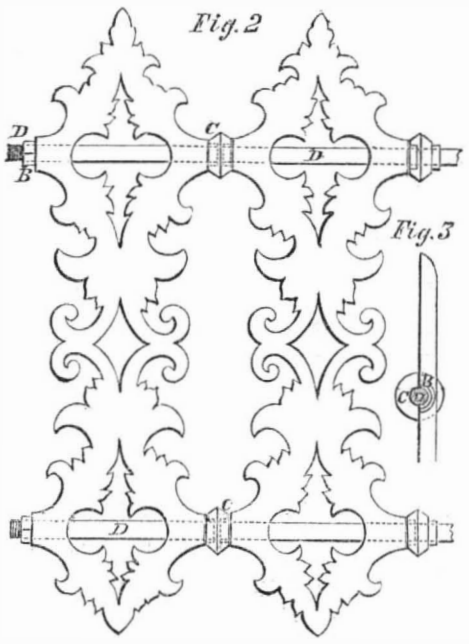

LAND LEECHES.

The island of Ceylon is celebrated for its tropical luxuriance of animal and vegetable life. Huge elephants roam its forests in large droves, and the richest spices impart fragrance to every breeze. Yet with all its abundance it does not seem to be a very inviting country for a residence. There appears to be a bitter for every sweet; poisonous serpents and noxious insects are very numerous, but the greatest pest of the whole country is the land leech. These plagues are most detested by travelers. In size they are about an inch in length and as fine as a knitting-needle, but they are capable of swelling out and distending until they are about two inches long and as thick as a writing-quill. They are so flexible that they can insinuate themselves through the meshes of the finest stocking, and ascend up the back to fasten upon the most tender parts of the body. They are never found in ponds and moist places, but lie among the grass and fallen leaves, and such is their vigilance and instinct, that they hear a man or horse at a considerable distance, when they prepare for attack with great alacrity. They advance by some circular strides and lay hold of the traveler's foot, raise themselves from the ground, and ascend his dress in search of an aperture to enter for a feast. Musquitoes, spiders, and centipedes are very troublesome pests, but they are all "gentlemen" in comparison with the land leeches of Ceylon.

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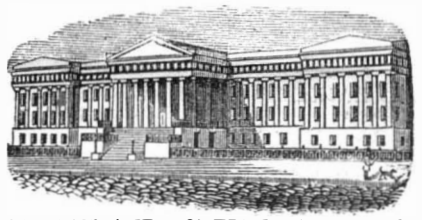

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Consultation may be had with the firm, between NINE and FOUR o'clock, daily, at their PRINCIPAL OFFICE, No. 37 PARK ROW, NEW YORK. We have also established a BRANCH OFFICE in the CITY OF WASHINGTON, on the CORNER OF F AND SEVENTH-STREETS, opposite the United States Patent Office. This office is under the general superintendence of one of the firm, and is in daily communication with the Principal Office in New York, and personal attention will be given at the Patent Office to all such cases as may require it. Inventors and others who may visit Washington, having business at the Patent Office, are cordially invited to call at our office.

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The annexed letters from the last two Commissioners of Patents we commend to the perusal of all persons interested in obtaining Patents:—

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CHAS. MASON.

Immediately after the appointment of Mr. Holt to the office of Postmaster-General of the United States, he addressed to us the subjoined very gratifying testimonial:—

MESSRS. MUNN & CO.:—It affords me much pleasure to bear testimony to the able and efficient manner in which you discharged your duties as Solicitors of Patents while I had the honor of holding the office of Commissioner. Your business was very large, and you sustained (and, I doubt not, justly deserved) the reputation of energy, marked ability, and uncompromising fidelity in performing your professional engagements. Very respectfully,
Your obedient servant, J. HOLT.

Communications and remittances should be addressed to
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